

IMP. INST. ENT.
LIBRARY

12 SEP 1942

U. S. A. 126

THE PAN-PACIFIC ENTOMOLOGIST

Published by the
Pacific Coast Entomological Society
in co-operation with
The California Academy of Sciences

CONTENTS

STRUBLE, BIOLOGY OF TWO DENDROCTONUS PREDATORS.....	97
MICHENER, BEES OF THE GENUS ANCYLOSCELIS.....	108
BARR, A NEW SPECIES OF ACMAEODERA.....	113
MITCHELL, NOTES AND DESCRIPTIONS OF MEGACHILE.....	115
BOHART, SYNOPSIS OF THE GENUS MICRALICTOIDES.....	119
HARRIS, HEBRUS CURTIS ANTEDATES NAEOGEUS LAPORTE.....	124
CHAMBERLIN, NEW CENTIPEDS FROM PANAMA.....	125
LINSLEY, NOTES AND DESCRIPTIONS OF PARASITIC BEES.....	127
DAHL, TAXONOMIC STATUS OF CICINDELA FORMOSA GIBSONI.....	132
SVIHLA, A NEW CTENOPHTHALMUS FROM FORMOSA.....	133
BEAMER, A NEW SPECIES OF DORYCEPHALUS.....	135
COCKERELL, COLLECTING WILD BEES IN THE YOSEMITE.....	136
KROMBEIN, A NEW SPECIES OF TIPHIA FROM CALIFORNIA.....	139
KNOWLTON, AMPHOROPHORA OSBORNI.....	143
THE AMERICAN COMMISSION ON SCIENTIFIC NOMENCLATURE.....	144

San Francisco, California

1942

THE PAN-PACIFIC ENTOMOLOGIST

EDITORIAL BOARD

E. S. ROSS
Assistant Editor

R. L. USINGER
Editor

E. C. VAN DYKE
Associate Editor

G. F. FERRIS

E. R. LEACH
Treasurer

E. G. LINSLEY

Published quarterly in January, April, July, and October with Society Proceedings appearing in the January number. Papers on the systematic and biological phases of entomology are favored, including articles up to ten printed pages on insect taxonomy, morphology, life history, and distribution.

Manuscripts for publication, proof, and all editorial matters should be addressed to the editor, R. L. Usinger, University of California College of Agriculture, Davis, California. All communications regarding non-receipt of numbers, changes of address, requests for sample copies, and all financial communications should be addressed to the assistant editor, E. S. Ross, or the treasurer, E. R. Leach, at the California Academy of Sciences, San Francisco, California.

At least twenty-five "author's extras" will be supplied free of charge. Additional copies will be *reprinted* at cost of publication, if a request is received when proof is returned.

Domestic and foreign subscriptions \$2.50 per year in advance. Price for single copies 75 cents. Make checks payable to "Pan-Pacific Entomologist."

INSECT BOXES



Standard size black insect box with sides of box and cover made of $\frac{1}{4}$ " redwood. The top, bottom and shoulders are of heavy cardboard.

Inside dimensions:

$12\frac{1}{4} \times 8\frac{1}{4} \times 2\frac{1}{8}$ inches.

Prices:

60 cents each.

Lots of one dozen, 50 cents each.

With Masonite bottom, 15 cents extra.

With glass top, 50 cents extra.

Prices for larger quantities on request.

Unit boxes also manufactured

Prices on application

RAISIN AND THIEBAUT BROS., LTD.

346 First Street, San Francisco, Calif.

Entered as second class matter, February 10, 1925, at the postoffice at San Francisco, California, under Act of August 24, 1912.



Digitized by the Internet Archive
in 2025

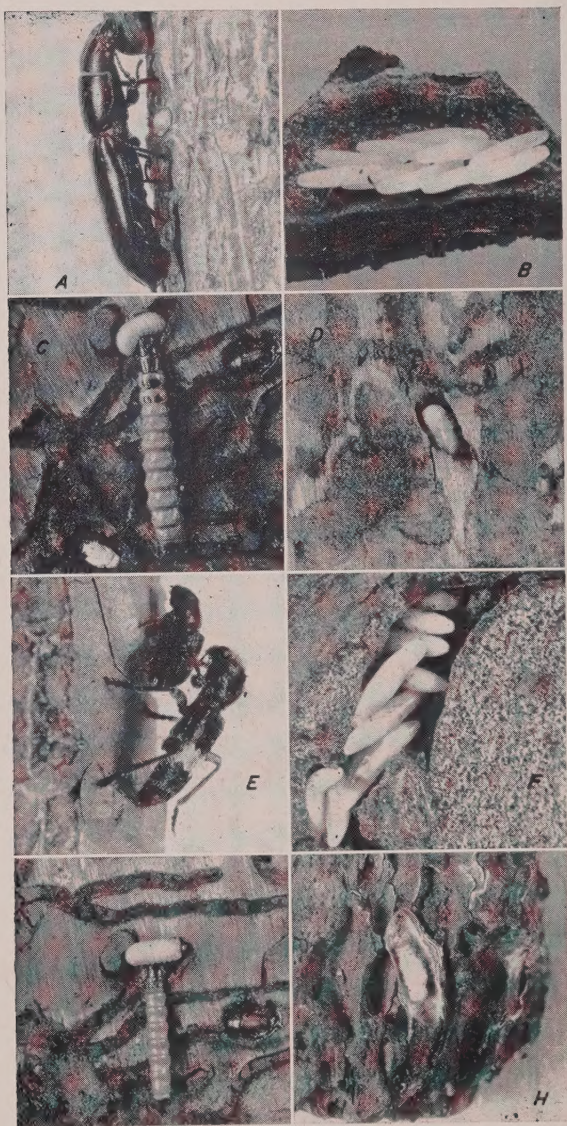


Fig. 1. *Temnochila virescens*: A, adult; B, eggs; C, larva attacking a grub of *Dendroctonus monticolae*; D, pupa in cell in bark. *Enoclerus sphegeus*: E, adult attacking a mountain pine beetle; F, eggs; G, larva attacking a beetle grub; H, pupa.

The Pan-Pacific Entomologist

VOL. XVIII, No. 3

July, 1942

BIOLOGY OF TWO NATIVE COLEOPTEROUS PREDATORS OF THE MOUNTAIN PINE BEETLE IN SUGAR PINE

BY G. R. STRUBLE

U. S. Department of Agriculture
Bureau of Entomology and Plant Quarantine

INTRODUCTION

Temnochila virescens (F.) (Ostomatidae) and *Enoclerus spegeus* (F.) (Cleridae) are recognized as important predators of bark beetles in the West. These two coleopterous insects are associated consistently with bark beetle infestations in most of the western pines. They are found also with infestations in white fir, red fir, and Douglas fir, but do not occur as regularly or in such great numbers in these trees as in the pines. *T. virescens* is also associated frequently with bark- and wood-borers infesting incense cedar and several hardwoods, including oak. Both insects are among the largest and are probably the most important of several species of predaceous Coleoptera associated with bark- and wood-boring beetles infesting western forests.

In sugar pine stands these predators are associated closely with the mountain pine beetle, *Dendroctonus monticolae* Hopk. *Temnochila virescens* develops on the beetles attacking the trees in the summer, and *Enoclerus spegeus* on those attacking the trees in the fall. Either species may be found in adult and larval stages at any time of the year, the adults preying on bark beetles from spring to fall and the larvae preying on the developing broods of the bark beetle. During the winter the adults hibernate in the bark crevices while the larvae remain inactive under the bark. The habits and possible controlling effect of adults and larvae have long been considered important in limiting the aggressiveness of the mountain pine beetle in sugar pine stands. For this reason detailed investigations of their life histories and behavior, which form the basis of this paper, were initiated as a preliminary step in determining the value of these two insects.

Except for one account of *Enoclerus spegeus* by Böving and Champlain (1920) the small amount of published information on the habits of these insects is quite general in character. These authors gave detailed information on the life history and the habits of this insect in its association with the Black Hills beetle, *Dendroctonus ponderosae* Hopk. They stated that this insect "should prove of great benefit as a predator on *Dendroctonus* and other bark beetles in coniferous trees during control operations." Brief discussions of both predators are contained in publications by Essig (1926), Doane et al. (1936), and Keen (1928). In a recent paper by Person (1940), *Temnochila virescens* is compared briefly with the black-bellied clerid, *Thanasimus lecontei* (Wolc.) in studies made on the association of this beetle with the western pine beetle, *Dendroctonus brevicomis* Lec.

The present paper considers primarily the developmental period from egg to adult and the feeding habits of adults and larvae. No attempt will be made here to evaluate the relative importance of the two species, since this information will be presented in a separate paper. Natural infestations, rearing records, and experiments, all concerned with the mountain pine beetle in sugar pine, supplied the factual material from which this contribution was prepared.*

TEMNOCHILA VIRESCENS (F.)

Seasonal Development and Habits

In its association with the mountain pine beetle, *Temnochila virescens* requires a full year to complete a life cycle. Eggs are laid from May to September in green trees freshly infested by the bark beetle. The larvae remain in these trees during the following autumn, winter and spring months. Pupation occurs late in the spring and early in the summer, and adults emerge from May to August, one year after the deposition of the eggs.

Figure 2 depicts a typical developmental cycle of *Temnochila virescens* in relation to its host, beginning in June of a given year and ending in July of the following year.

Adults. The adults (fig. 1, *A.*) are a brilliant, iridescent metallic blue or green, flattened and elongate, their length rang-

* Observations and experiments were made in the central Sierra Nevada Mountains near Wawona, California, at elevations between 4,500 and 6,500 feet, where optimum conditions prevail for sugar pine growth. Mountain pine beetle infestations here provided continuous material for the study of broods and variations during the period of this study from 1937 to 1940.

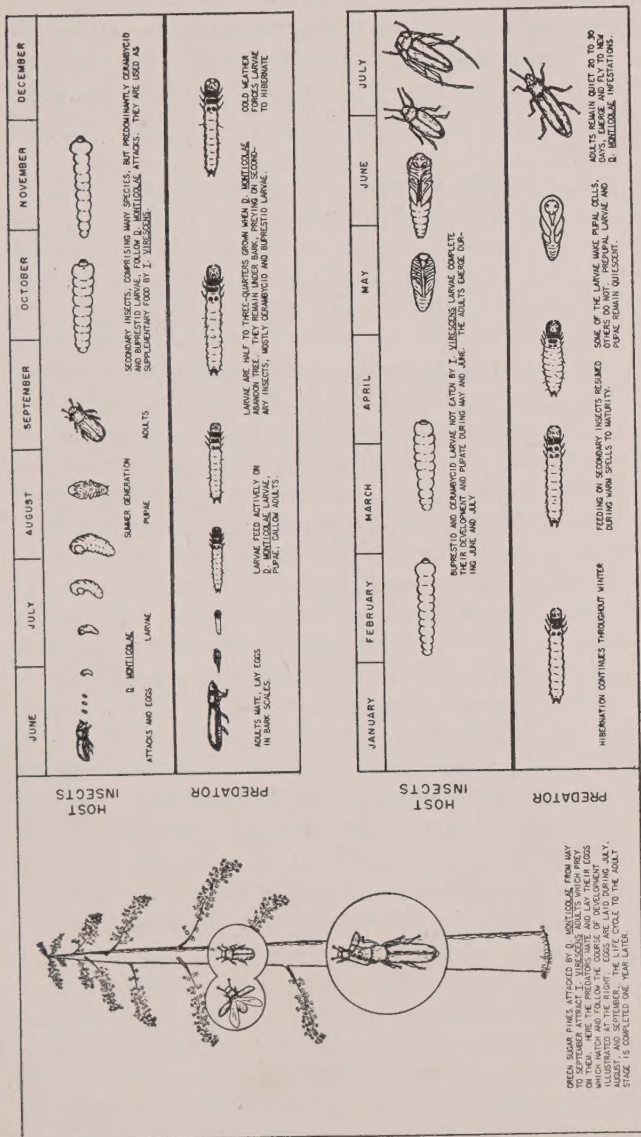


Fig. 2. Life cycle of *Temnochila virescens* in relation to *Dendroctonus monticolae* in sugar pine.

ing from 10 to 18 mm. In winter they hibernate in the bark crevices of infested trees, where they remain inactive until the advent of warm weather. From spring to fall they are most numerous on trees that are being infested by bark beetles, where they crawl stealthily over the bark and in the crevices searching out their prey.

They feed actively in confinement, consuming an average of from 1 to 3 mountain pine beetle adults per predator in a 24-hour period. Frequently as many as 15 bark beetles are killed, and many of these are devoured completely in a day by one large adult of *Temnochila virescens*. The predator kills by crushing the body of its victim with two powerful, piercing mandibles.

The ratio of males to females in the adults, as determined from 695 specimens reared in the laboratory from the egg stage, was 1.1 to 1.0. There is little reason to believe that the rearing environment or the small amount of handling would have had any influence on this ratio. It indicates an even distribution of sexes. Determinations were made by use of an external sex character described by Struble and Carpelan (1940).

A period ranging in length from 4 to 7 weeks is required before newly emerged females will deposit eggs. Whether this characteristic is influenced by food habits is not clear, but specimens under observation were fed frequently during the observed period. They were not compared, however, with unfed individuals. The total life period of both male and female adults ranged between 3½ and 8 months among specimens held in confinement and fed periodically. Females confined during the entire 8-month period at 75° F. laid eggs consistently each week, following the initial oviposition.

Eggs. The eggs (fig. 1, B) are 2.5 to 3 mm. long and 0.3 to 0.5 mm. wide, with pointed or rounded ends. The color is usually a delicate shade of pink, although some of the eggs are nearly white. They are deposited between bark scales, usually deep in the crevices of the bark, and often near the entrance hole of a bark beetle. Some are laid singly whereas others are deposited in groups of from 2 to 50 and are cemented together with a sticky secretion. The incubation period is 7 to 14 days under field conditions.

The number of eggs laid per female under laboratory conditions was found to range from 38 to 581. The average number

laid by 12 females during one experiment lasting 16 weeks was 111, with individual production ranging from 38 to 232 eggs. The viability of 2,500 eggs tested was 69 percent.

Larvae. The larvae (fig. 1, C) are from 25 to 30 mm. long at maturity. They are grayish white, with the head black and flattened. The dorsal surface of each of the first two thoracic segments is covered by a pair of black sclerotized plates, which are contiguous along the mid-line. In the third thoracic segment the dorsal sclerotized plates are smaller and separated from each other. The last abdominal segment is armed dorsally with a black, hardened hooklike process. There are three pairs of well-developed legs.

The first instars remain huddled together for 24 to 48 hours after hatching, and then scatter. They enter the bark usually through the entrance or ventilation holes of the mountain pine beetle. Within the inner phloem layer they search for and devour larvae, pupae, and callow adults of their beetle prey by burrowing through frass or through phloem tissue. They are not restricted in their diet to the mountain pine beetle, but prey indiscriminately on all living insects except the hardened mature adults. They are also highly cannibalistic, even in the presence of an ample quantity of other food.

For the first 2 months, larvae of *Temnochila virescens* feed actively on the brood of the mountain pine beetle. The average number of grubs devoured during this period ranges from 30 to 60 per individual. After that they are forced to feed on secondary fauna under the bark, mainly cerambycids, owing to the fact that the mountain pine beetle has completed its development and emerged. Observations have consistently shown that the larvae of this predator remain beneath the bark where they first established themselves.

To remain alive, newly hatched larvae must feed within 2 weeks, but after they have once fed they are capable of living many months without food. In five laboratory tests involving 117 newly hatched larvae, each in a separate container without host food, mortality consistently amounted to greater than 50 percent after 7 to 10 days and was 100 percent by the end of 2 weeks. In two other tests, involving 350 newly hatched larvae placed in separate containers, each larva was given 3 small larvae of the mountain pine beetle during a 10-day period in September, 1939.

Thereafter no host food whatever was given them; but in July, 1940, 10 months later, 178 larvae, or 50 percent of the original number, were still alive. Many of the others were found to have died from attacks by the mite, *Pediculoides ventricosus* (Newport).

By reason of great differences in the period required for brood development, larvae of *Temnochila virescens* are divided into two groups designated as *short-term* and *long-term* larvae. The short-term larvae, comprising not over 5 percent of the total number studied, required from 10 to 12 weeks to reach maturity at 75° F. The long-term larvae required 30 weeks to reach maturity at 75°, and 12 months under field conditions. The short-term larvae molted, consistently, five times during the course of their development. The long-term larvae were found to have an additional molt, with records of seven among some individuals. The cause of short-term development was not determined definitely, but studies indicated that it was not linked with the quantity of food eaten or with an hereditary strain. The number of short-term larvae in association with the mountain pine beetle are too few to be regarded as important.

Pupae. Pupation occurs usually within the bark or in the phloem, at or near the position occupied by the last instar. As a rule the larva hollows out a pupal cell, but not always, for the pupae are often found lying in loose frass beneath the bark. The pupae (fig. 1, *D*) are at first pinkish or cream colored, turning darker with age. The pupal period ranges from 11 to 20 days at field temperatures.

Natural Enemies

No important natural enemies of *Temnochila virescens* were found in any stage of its development under field conditions. This was also the case in laboratory rearing experiments except in the one instance wherein the mite, *Pediculoides ventricosus*, infested one group of larvae, causing considerable mortality. Adults occasionally become infested with a reddish-colored mite which does no apparent harm. In combination with the competition from other predaceous insect larvae associated with infestations of the mountain pine beetle, the factor of cannibalism tends to regulate its numbers.

ENOCLERUS SPHEGEUS (F.)

Seasonal Development and Habits

The red-bellied clerid, *Enoclerus sphegeus* (F.), develops one generation annually. The adults are found in September, October, and November in sugar pines that are being attacked by the mountain pine beetle. They remain in these trees, hibernating in the bark crevices during the winter months. Eggs are laid on warm days in the fall and again in the spring. The larvae reach maturity and migrate to the base of the tree to pupate by the time the host brood has begun to emerge in June. They remain inactive for 30 or more days before pupation.

Figure 3 illustrates a typical development cycle of *Enoclerus sphegeus* in relation to the overwintering generation of the mountain pine beetle in sugar pine.

Adults. The adults (fig. 1, *E*) are much more active than other bark beetle predators, and in their rapidity of movement resemble large flying ants or wasps. They range in length from 8 to 12 mm. They are bronze black with a transverse wavy bar of white pubescence across the middle of the elytra. The abdomen is bright orange. The entire body is covered by short white setae, giving it a grayish cast.

During warm weather in the fall and spring the adults are found running over the bark surface and darting among the cracks of recently infested sugar pines. They are difficult to catch because they hide quickly or fly away at the least disturbance. They are most numerous on the trunks of green trees that are being attacked by mountain pine beetles.

They prey on *Dendroctonus monticolae* in a manner characteristic of this insect. The adult usually approaches its prey from behind, but it may attack it from any position. Then, by quick and precise manipulation with the front and middle pairs of legs, it grasps the host and turns it over so that the ventral portion faces the mandibles of the attacker. Instantly it bites into the soft tissues between the head and thorax, or between the prothorax and the mesothorax, and drains the body of its juices and soft tissues. Wings, wing covers, and appendages are dismembered, and the body segments are torn apart. Only fragments of the host are left after 20 minutes to a half-hour of feeding. In

the laboratory the average number of *D. monticolae* devoured in repeated tests was about 1 beetle in 27 hours.

Enoclerus spegeus adults are shorter lived than those of *Temnochila virescens*. Under laboratory manipulation involving mating pairs in individual containers the maximum life period was 2½ months, and the egg-laying period 8 weeks. This life period is considerably less than that occurring under field conditions where adults are known to hibernate during the winter. Often in the close quarters the nervous activity of the beetles led to entanglements which resulted in death to one of them, usually the male.

Eggs. The eggs (fig. 1, *F*) are pink or orange. They are cigar shaped and range in length from 3 to 4 mm. They are deposited beneath the bark scales, usually near the entrance hole of a bark beetle, in groups of 2 to 25, and are cemented together. In laboratory tests the average number of eggs laid per female was 51, the maximum 93, and the minimum 5. The incubation period ranges in length from 8 to 14 days under field conditions. Egg viability was somewhat less than 70 percent.

Larvae. The newly hatched larvae are pink or light orange. As they develop the color turns to deeper orange, and finally becomes a bluish purple in the last instar before pupation. Except for color the general appearance of the larvae (fig. 1, *G*) is similar to that of *Temnochila virescens*. The head and sclerotized portions of the thorax are brownish black; the thoracic spots are less conspicuous. The last abdominal segment terminates dorsally in a forked caudal appendage.

The larvae crawl readily by means of three pairs of well-developed legs. They begin migration to the interior of the bark within 24 to 48 hours after they have hatched in the fall or spring, entering usually through an entrance or ventilation hole of the mountain pine beetle. Beneath the bark they prey upon all stages of the mountain pine beetle brood except the mature adults. They are active feeders. Each larva requires approximately 10 mature larvae of the mountain pine beetle for complete development. They are also cannibalistic, especially within limited spaces.

Under favorable temperature conditions they develop to maturity in from 4 to 6 weeks, passing through three instars. Most of them are mature by the end of June among the overwintering

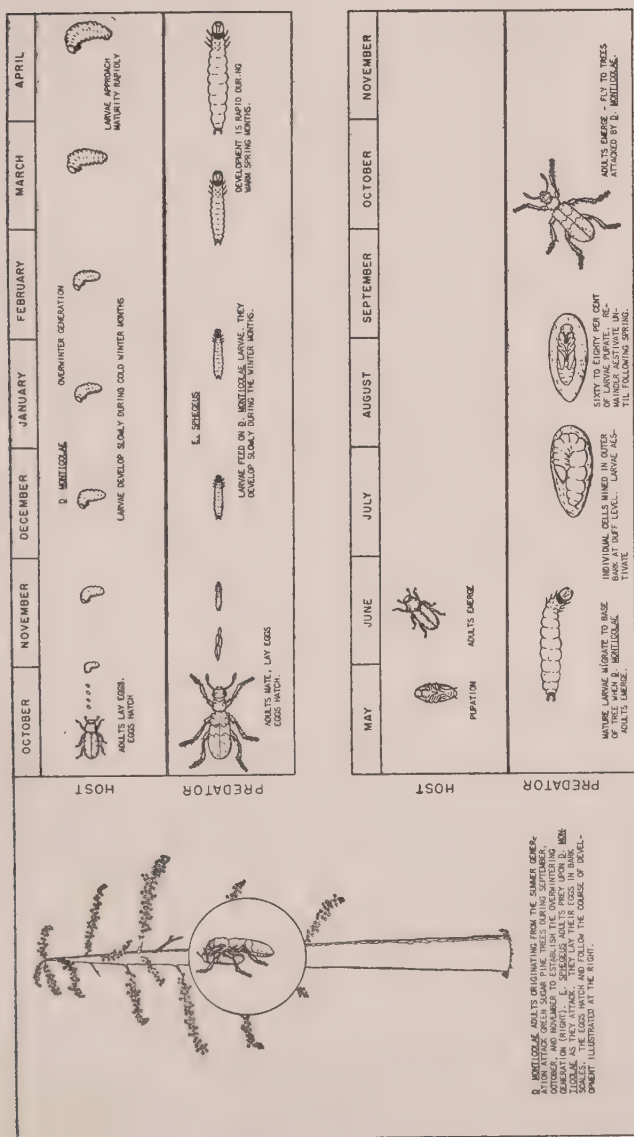


Fig. 3. Life cycle of *Enoclerus sphegeus* in relation to *Dendroctonus monticolae* in sugar pine.

broods of *Dendroctonus monticolae*. With the beginning of emergence of the mountain pine beetle the larvae migrate down the bole to the duff level, where they burrow into the outer bark. Each larva then hollows out a pupal cell, lining it with a silvery, foamlike secretion which exudes from the mouth. Then they remain quiescent in the cell with the head and thorax bent in against the abdomen. Within 30 days after this migration the larvae begin to pupate. About 30 percent do not pupate until the following spring, remaining unchanged throughout the summer and hibernating during the winter months. Pupal cells are found occasionally within the duff or in decomposing wood near the base of a tree when there is insufficient suitable bark, as is the case on trees heavily scarred by fire.

Pupae. The pupal stage (fig. 1, *H*) is found chiefly during August. The body portion of the pupa is light orange, while the appendages are nearly translucent. With advancement in age all portions turn darker. The pupal period at normal summer temperatures requires an average of 20 days before emergence of adults. Adults begin emerging early in September, but do not appear in numbers before October and November.

Natural Enemies

Like *Temnochila virescens* this insect is comparatively free from insect enemies. Reddish-colored mites were observed frequently on the adults, but these did not appear to affect them appreciably. Cannibalism, however, is common, and this habit may account for the death of many. The effect of other predaceous Coleoptera associated with *Enoclerus sphegeus* beneath the bark of infested sugar pines is probably negligible, since they are all very much smaller.

SUMMARY

Temnochila virescens and *Enoclerus sphegeus* are two native coleopterous predators of bark beetles and are commonly associated with infestations in many conifers in the West. In sugar pine they are associated with infestations of the mountain pine beetle. Their habits and life histories with this host were investigated as a preliminary step to determine their importance as control factors.

Both insects in the adult stage prey on mountain pine beetle adults as the latter attack green trees. In the larval stage they enter the bark to prey on the immature broods of the mountain pine beetle.

Each predator requires one year to complete development from egg to adult. *Temnochila virescens* develops its broods in trees attacked in the summer, whereas *Enoclerus sphegeus* develops its broods in trees attacked in the fall. Thus each predator is reared separately on the two seasonal broods of the mountain pine beetle.

Temnochila virescens lays its eggs from May to September. The larvae feed actively until the summer-generation broods of the mountain pine beetle take flight. They complete their development on secondary insects occurring beneath the bark. Adults emerge one year after the eggs are laid.

Enoclerus sphegeus lays its eggs during warm weather in the fall and spring. The larvae complete development and migrate to the base of the infested tree when mountain pine beetles begin flight in June. They pupate in cells during August. The adults emerge during September, October, and November.

Natural enemies of these two predators are unimportant, but cannibalism is a definite factor which tends to reduce their numbers.

LITERATURE CITED

- Böving, A. G., and A. B. Champlain. 1920. Larvae of North American beetles of the family Cleridae. U. S. Nat. Mus. Proc. 57(2323):275-649. 12 pls.
- Doane, R. W., E. C. Van Dyke, W. J. Chamberlin and H. E. Burke. 1936. Forest insects. McGraw-Hill Book Co., Inc., New York and London. 1-463. 234 figs.
- Essig, E. O. 1926. Insects of Western North America. MacMillan Co., New York. 1-1035. 766 figs.
- Keen, F. P. 1928. Insect enemies of California pines and their control. Calif. State Dept. of Nat. Res., Div. Forestry Bul. 7:1-113. 51 figs.
- Person, H. L. 1940. The clerid *Thanasimus lecontei* (Wolc.) as a factor in the control of the western pine beetle. Jour. For. 38:390-396. 1 fig.
- Struble, G. R. and L. H. Carpelan. 1941. External sex characters of two important native predators of the mountain pine beetle in sugar pine. Pan-Pacific Entomologist. 17:153-156. 2 figs.

NORTH AMERICAN BEES OF THE GENUS *ANCYLOSCELIS*
(Hymenoptera, Anthophoridae)

BY CHARLES D. MICHENER

*American Museum of Natural History, New York**

Ancyloscelis is a genus of bees widely distributed in the Neotropical Region and ranging northward as far as southern Colorado. In the present paper only those species known to occur in Mexico and the United States are considered.

Since the generic name *Ancyloscelis* has been subject to confusion for many years, its history is here briefly reviewed. The French vernacularized name *Ancyloscèle* was listed without description by Latreille (1825:463) and this is given as the original citation for *Ancyloscelis* by both F. Smith (1854:367) and Dalla Torre (1896:222). The name *Ancyloscelis*, however, was apparently first used by Berthold (1827:466) in his German edition of Latreille's work of 1825. Being unaccompanied by a description or figure, the name was a *nomen nudum*. In 1829 Latreille [in Cuvier, (1829:355)] gave a brief description of *Ancyloscelis*, but mentioned no species. The name is treated in approximately the same manner in the numerous later editions of Cuvier's work. Not until 1836 was a species included in the genus. In that year Haliday, using the spelling *Ancylosceles*, described a species, *ursinus*. Cockerell has used this latter spelling and credited the generic name to Haliday. However, Haliday's *Ancylosceles* is evidently only a misprint or an incorrect use of the French pleural vernacular (*les Ancyloscèles*) which appears in the second and following editions of Cuvier's "Règne Animal." Since Haliday clearly intended to place his species in Latreille's genus, *A. ursinus* Haliday, as the first included species, necessarily becomes the type species of *Ancyloscelis* Latreille, even though Latreille's original specimens apparently belong to the genus now called *Tetrapedia* (see Cockerell, 1922).

Diadasia Patton was placed as a synonym of *Ancyloscelis* by Ashmead (1899:64). Friese (1906:92) following Ashmead in his interpretation of *Ancyloscelis*, proposed the name *Dipedia* for the species of *Ancyloscelis* as now understood. Cockerell, on the other hand, placed these forms in *Leptergatis* Holmberg. Upon studying specimens identified as *L. halictoides* Holmberg, the type species of *Leptergatis*, he concluded that that genus was

* This paper was prepared at the University of California, Berkeley, California.

related to *Melitoma* and distinct from *Ancyloscelis*. His examination of the type specimen of *Ancyloscelis ursinus* Haliday showed it to belong to the genus *Ancyloscelis* as understood by recent authors and not, as Ashmead had supposed, to the group now called *Diadasia*. *Dipedia* Friese therefore becomes a synonym of *Ancyloscelis*.

Genus ANCYLOSCELIS Latreille

Ancyloscelis Latreille, 1829, in Cuvier, Règ. Anim., 2nd ed., 5:355; Haliday, 1836, Trans. Linn. Soc. London, 17:320 (as *Ancylosceles*); Smith, 1854, Cat. Hymen. Ins. Coll. Brit. Mus., 2:367; Holmberg, 1903, Anal. Mus. Nac. Buenos Aires, (3)2:430; Friese, 1904, Zeit. f. syst. Hymen. u. Dipt., 4:20; Brèthes, 1909, Anal. Mus. Nac. Buenos Aires, (3)12:221; Lutz, 1920, Bull. Am. Mus. Nat. Hist., 42:641; Cockerell, 1921, Ent. News, 32:76 (as *Ancylosceles*). Genotype: *Ancylosceles ursinus* Haliday, by single reference (Haliday, 1836).

Dipedia Friese, 1906, Flora og Fauna, 8:92; Lutz and Cockerell, 1920, Bull. Am. Mus. Nat. Hist., 42:592. Genotype: *Ancyloscelis armata* Smith, designated by Lutz and Cockerell, 1920.

Leptergatis Cockerell (nec Holmberg), 1912, Ann. Mag. Nat. Hist., (8)10:29; Lutz and Cockerell, 1920, Bull. Am. Mus. Nat. Hist., 42:592.

KEY TO THE NORTH AMERICAN SPECIES OF ANCYLOSCELIS

Males

1. Small tooth of inner ventral angle of posterior tibiae far beyond middle; tooth of base of posterior basitarsi small.....*toluca*
- Small tooth of inner ventral angle of posterior tibiae but little beyond middle; tooth of base of posterior basitarsi large.....2
2. Clypeus with an apical transverse white band; labrum largely white; apical emargination of sixth sternum deep with sides at acute angle to one another.....*armatus*
- Clypeus black; labrum with at least large black areas; apical emargination of sixth sternum broader and shallower.....3
3. Apical emargination of sixth sternum with sides at a slightly obtuse angle to one another.....*sejunctus*
- Apical emargination of sixth sternum with sides at a slightly acute angle to one another.....*melanostomus*

ANCYLOSCELIS TOLUCA (Cresson)

Melissodes toluca Cresson, 1878, Proc. Acad. Nat. Sci. Phila., p. 219.

Diadasia toluca, Fox, 1894, Proc. Calif. Acad. Sci., (2)4:118.

Eucera toluca, Dalla Torre, 1896, Cat. Hymen., 10:249.

Entechnia toluca, Cockerell, 1905, Am. Nat., 39:741.

Leptergatis toluca, Cockerell, 1912, Ann. Mag. Nat. Hist., (8)10:29.

Ancylosceles toluca, Cockerell, 1923, Proc. Calif. Acad. Sci., (4)12:

This species is unknown to me. *A. wheeleri* (Cockerell) (1912, Psyche, 19:105) described from Guatemala is apparently closely related to *toluca*, if not synonymous with it. *A. toluca* itself has been recorded from Guatemala.

Type: from MEXICO, in the Academy of Natural Sciences of Philadelphia. It is possible that the Fox Lower Californian record of *toluca* refers in reality to *melanostomus*.

ANCYLOSCELIS ARMATUS Smith

Ancyloscelis armata Smith, 1854, Cat. Hymen. Ins. Coll. Brit. Mus., 2:367; Friese, 1904, Zeit. f. syst. Hymen. u. Dipt., 4:22.

Ancyloscelis armatus, Cockerell, 1905, Trans. Am. Ent. Soc., 31:325.

Eucera armata, Dalla Torre, 1896, Cat. Hymen., 10:225.

Dipedia armata, Friese, 1906, Flora og Fauna, 8:92.

Leptergatis armata, Cockerell, 1912, Ann. Mag. Nat. Hist., (8)10:29.

Male: Length, 7 to 7½ mm. Inner margins of eyes converging below; flagellum dark brown beneath; clypeus rather coarsely punctured with a narrow, transverse, yellowish white, subapical band; labrum yellowish white, the margin narrowly fuscous; mandibles with large basal areas white, median parts reddish, apices black; frons and vertex considerably more finely punctate than clypeus. Mesoscutum and mesoscutellum more coarsely and closely punctate than clypeus; mesepisterna similarly but a little less closely punctate, especially below; tegulae translucent brown; wings clear; tarsi ferruginous; posterior legs greatly thickened; inner ventral angle of posterior tibiae with a small tooth a little distad to middle of tibiae; posterior tibial spurs slightly bent, outer markedly shorter than inner; posterior basitarsi produced ventrally at apex to an acute point, ventrally at base to form a large, curved, acute tooth; claws and terminal segments of posterior tarsi far larger than those of other tarsi; posterior surface of propodeum, including enclosure, rather dull and minutely roughened. Abdomen finely punctate; posterior margins of terga one to five with fasciae of white pubescence, broken medially on first tergum; fascia of sixth tergum reddish brown; pubescence between abdominal fasciae short, sparse, fuscous; emargination of sixth sternum deep and acute.

This species was described from BRAZIL but has been recorded from ARGENTINA (Friese, 1906) and from as far north as GUATEMALA (Cockerell, 1912) and MEXICO (Friese, 1904). Two male specimens from UVALDE, TEXAS, June 15, 1930 (E. G. Linsley and J. O. Martin, Calif. Acad. Sci.) agree well with descriptions of *armatus* and are placed in that species for the present, although the examination of South American material may event-

ually show them to represent distinct species. The preceding description is based upon the Texan specimens.

Type: male, from Brazil, in the British Museum (Natural History).



Fig. 1, Lateral view of *Ancyloscelis sejunctus* Cockerell, male; Fig. 2, Emargination of sixth abdominal sternum of *A. armatus* Smith, male; Fig. 3, Emargination of sixth abdominal sternum of *A. sejunctus* Cockerell, male; Fig. 4, Emargination of sixth abdominal sternum of *A. melanostomus* Cockerell, male.

ANCYLOSCELIS SEJUNCTUS Cockerell

Ancylosceles sejuncta Cockerell, 1933, Am. Mus. Nov., 595:1.

Ancylosceles maculifera Cockerell, 1934, Am. Mus. Nov., 697:8 (new synonym); Cockerell, 1935, Am. Mus. Nov., 766:4.

This species, in the male, differs from *armatus* thus: clypeus black; labrum black or with small whitish area medially; white hair bands of abdominal terga broader, more broadly broken on anterior two terga, that of sixth tergum white like preceding ones; apical emargination of sixth sternum broad and slightly obtuse.

A. sejunctus was described from BACA COUNTY, COLORADO, and has been twice recorded (as *maculifera*) from BEXAR COUNTY, TEXAS. Specimens before me are from SABINO CANYON, ARIZONA, August 14, 1924 (E. P. Van Duzee).

Type: male, REGNIER, BACA COUNTY, COLORADO, in the American Museum of Natural History.

I am much indebted to Mr. H. F. Schwarz for the information upon which the above indicated synonymy is based. At my request, he has examined the types of both *sejunctus* and *maculifera*, comparing them with an Arizona specimen. He found the types of *sejunctus* and *maculifera* to be very similar, differing chiefly in the presence of a dull whitish spot on the labrum of the latter. This spot is absent in the San Antonio, Texas, specimens recorded as *maculifera* by Cockerell in 1935. Certain differences which appear from the descriptions to separate the two forms are of no value. Thus the pterostigmata are of the same color in the two types, and the mandibles of both have whitish areas basally, barely less conspicuous in *sejunctus* than in *maculifera*, although such areas are described as absent in *sejunctus*.

ANCYLOSCELIS MELANOSTOMUS Cockerell

Ancylosceles melanostoma Cockerell, 1923, Proc. Calif. Acad. Sci., (4)12:83.

This is probably a form of *sejunctus*, from which it seems to differ only in the larger and deeper emargination of the sixth sternum of the male. In view of the extremely limited amount of material available, the absence of specimens intergrading between *sejunctus* and *melanostomus*, and the apparent geographic separation of the two forms, it has seemed best to regard them as separate species for the present. The mandibles in the holotype of *melanostomus* have a dull whitish area basally on each, just as in *sejunctus*, although they were described as black.

Type: male, LA PAZ, LOWER CALIFORNIA, in the California Academy of Sciences.

LITERATURE CITED

- Ashmead, W. H. 1899. Classification of the bees or the superfamily Apoidea. Trans. Am. Ent. Soc., 26:49-100.
Berthold, A. A. 1827. Natürliche Familien des Thierreichs. Indust.-Compt., Weimar, 602 pp.
Cockerell, T. D. A. 1921. The bee-genus *Ancylosceles* Haliday (Hymn.). Ent. News, 32:76-77.
1922. Descriptions and Records of Bees.—XCIV. Ann. Mag. Nat. Hist., (9)9:660-668.
Dalla Torre, C. G. de. 1896. Catalogus Hymenopterorum. Engleman, Leipzig, 10:viii+643.

- Friese, H. 1906. Resultate einer Reise des Herrn A. C. Jensen-Haarup in die Gegend von Mendoza (Argentina). *Flora og Fauna*, 8:89-102.
- Haliday, A. H. 1936. Descriptions of Hymenoptera collected by Capt. King in the survey of Straits of Magellan. *Trans. Linn. Soc. London*, 17:316-331.
- Latreille, P. A. 1825. *Familles naturelles du règne animal*. Baillière, Paris, 570 pp.
1829. in Cuvier, *Règne animal*, 2nd. ed., Déterville, Paris, 5:xxiv +556.
- Lutz, F. E. and T. D. A. Cockerell. 1920. Notes on the distribution and bibliography of North American bees of the families Apidae, Meliponidae, Bombidae, Euglossidae, and Anthophoridae. *Bull. Am. Mus. Nat. Hist.*, 42:491-641.

A NEW SPECIES OF ACMAEODERA FROM SOUTHERN CALIFORNIA

(Coleoptera, Buprestidae)

BY WILLIAM F. BARR

University of California, Berkeley

The writer wishes especially to thank M. A. Cazier for his helpful suggestions and loan of specimens and E. C. Van Dyke, E. S. Ross, E. G. Linsley, and J. N. Knull for their generous and valuable assistance.

Acmaeodera ephedrae Barr, new species

Medium-sized, robust. Head and pronotum unicolorous, aeneous black, shining. Elytra straw colored, suture, umbones and outer margins cupreous brown. Under surface uniformly, closely punctate throughout and densely clothed with what appears to be a dense felt-like tomentum; prosternal margin slightly retracted from anterior pronotal angles; last abdominal segment evenly rounded without a subapical carina.

Head rather deeply, coarsely punctate, reticulate, matted with short, silvery white, recumbent hairs, thinning out on vertex, two denuded areas just above antennal insertions; clypeus rather deeply emarginate, finely punctate, sparsely covered with short, suberect, whitish hairs; antennae abruptly serrate beginning with fifth segment, extending to hind margin of pronotum.

Pronotum widest at basal fourth, slightly wider than elytra, slight trace of median depression, convex, shallowly, coarsely, punctate, reticulate, densely covered with short, silvery-white, recumbent hairs except on disk which is sparsely covered with long, white, subrecumbent hairs; anterior margin sinuate, as wide as base; basal margin slightly emarginate; side margins obsolete, not visible from above.

Elytra with sides strongly sinuate behind umbones, middle not as wide as base, evenly rounded to blunt apex; margins of apical third serrate; striae well pronounced, strial punctures deep, rather small, separated by their own width or less than their own width, striae distinctly separated by more than width of strial puncture, interspaces with small punctures rather widely separated, each small puncture giving rise to a short, white, suberect, setiform hair.

Legs with femora densely clothed with long, silken, white, recumbent hairs and dense, felt-like tomentum; tibiae and tarsi more sparsely clothed with silken, white, recumbent hairs.

Length, 7.8 mm.; *width*, 2.8 mm.

Holotype in author's collection, collected five miles north of PALM SPRINGS, RIVERSIDE COUNTY, CALIFORNIA, July 2, 1941 (W. F. Barr). A single specimen was collected from *Ephedra*.

This species belongs in the truncate group and in Fall's key¹ will run to *Acmaeodera neglecta* Fall and the immaculate forms of *A. quadrivittata* Horn. However, it is only distantly related to these species. *A. ephedrae* is most closely allied to the recently described species, *A. fisheri* Cazier, *A. barri* Cazier, and *A. palmarum* Timberlake. It also bears a superficial resemblance to *A. discalis* Cazier from which it may easily be distinguished by the finer elytral punctures, sinuate sides of elytra, lack of vittae and by the presence of the dense felt-like tomentum on the ventral surface. *A. ephedrae* differs from *A. neglecta* and *A. quadrivittata* in that it is larger, more convex and sinuate, has coarse, shallow, reticulate pronotal punctures, and has a different type of vestiture beneath. In separating *A. fisheri* from *A. ephedrae*, the latter species is more convex, the pronotum is more densely punctured with the disk containing long, silky, subrecumbent hairs and the elytra are immaculate. *A. ephedrae* is easily distinguished from *A. barri* by its much broader form, its straw color and by the elytral vestiture which is composed of hair rather than scales. *A. ephedrae* differs from *A. palmarum* by its larger, flatter, broader form, the presence of hair rather than scales on the elytra, and by the dense felt-like tomentum rather than distinct scales of the under surface.

The writer is also aware of a species described by Kerremans under the name *Acmaeodera pallidula*. No specimens of this species were available for examination but *A. ephedrae* is undoubtedly distinct from it as *A. pallidula* lacks the dense tomentum beneath.

¹ Fall, H. C., 1899, Jour. N. Y. Ent. Soc., 7(1):1-37.

NOTES AND DESCRIPTIONS OF NEARCTIC MEGACHILE
(Hymenoptera, Megachilidae)¹

BY THEODORE B. MITCHELL

University of North Carolina, Raleigh

Since the publication of the several parts of the Revision of the Genus *Megachile* in the Nearctic Region², a considerable number of collections of these bees have been received from several institutions and individuals for determination. The limitations of space make it difficult to publish all of the records that have accumulated through the study of this material, but some apparently new species which have been discovered are in need of description, and there are some remarks of significance to be made about a number of previously known species.

MEGACHILE (ANTHEMOIS) NIVALIS Friese

Evidence has accumulated which seems to indicate that *nivalis* is very closely related to *M. relativa* Cresson, and may possibly represent a race of that species. Several males have come to hand which have been collected along with females of *nivalis*, although no instances of pairs *in copula* have been noted. These males are so nearly identical with the males of *relativa* that no satisfactory means of separating them has been found. Moreover, there is some variability in the females of *nivalis* in the extent of black hairs in the scopa. Typically the scopa is entirely black on the fifth and sixth sterna, but several specimens have been examined in which that on the fifth segment is considerably paler in color, or with the more basal hairs pale. In all specimens, however, the sixth tergum is entirely fuscous pubescent, in marked contrast to the golden tomentum of *relativa*, and the average size of *nivalis* exceeds considerably that of *relativa*. It remains to be proven that these males that have been associated with *nivalis* are actually that species.

In addition to records of females from ALASKA, ALBERTA, MAINE, MANITOBA, MONTANA, ONTARIO, OREGON and WYOMING,

¹ Research Contribution No. 14 published with the aid of the State College Research Fund, Department of Zoology, North Carolina State College of Agriculture and Engineering of the University of North Carolina.

² Trans. Am. Ent. Soc. LIX, pp. 295-361 (1934); LXI, pp. 1-44, 155-205 (1935); LXII, pp. 117-166, 323-382 (1936, 1937); LXIII, pp. 45-83, 175-206, 381-426 (1937).

the following records include both sexes: 1♂, 2♀, PAMELIA L., MT. JEFFERSON, OREGON, 3,000 ft., July 25 and 27, 1907 (J. C. Bridwell). 1♂, 1♀, BEDFORD POINT LOOKOUT, east of ESTACADA, OREGON, 2500 ft., August 15, 1937. 1♂, 3♀, PITTSBURGH, COLUMBIA COUNTY, OREGON, 2000 ft., July 27, 1937, on *Epilobium angustifolium*, (H. A. Scullen). 2♂, 1♀, METALING FALLS, WASHINGTON, 2500 ft., July 25, 1931 (F. B. Foley).

MEGACHILE (DELOMEGACHILE) FRIGIDA Smith

Shortly before her death Dr. Grace Sandhouse called my attention to the fact that I was in error in my use of the name *vidua* instead of *frigida* for this species. Smith proposed both names, *vidua* for the female on p. 192 and *frigida* for the male on p. 193 (Cat. Hym. Brit. Mus. I, 1853). As the name *vidua* has page precedence, it was thought proper to use. However, Cresson in his Synopsis of Hymenoptera, p. 303, 1887, made *vidua* a synonym of *frigida* in spite of the page precedence of *vidua*, and according to article 28 of the International Rules of Zoological Nomenclature, "If the names are of the same date, that selected by the first reviser shall stand."

MEGACHILE (XANTHOSARUS) COCHISIANA Mitchell

At the time that this species was described, the female was unknown, although a series of that sex from Guadalajara, Mexico, was suspected to represent it. Since then a considerable series of males and females from California has been received and studied.

The female is almost identical with that of *dentitarsus* Sladen and runs to it in the key (Trans. Am. Ent. Soc. LXII, p. 122, 1936). The only recognizable difference which seems to be at all constant is the black pubescence in the center of the vertex, that being white in *dentitarsus*. In this latter species there is often dark shorter pubescence intermixed with the longer pale hairs on the vertex laterally, but there are no black hairs medially. In *cochisiana* the entire vertex is black pubescent.

The following records are in addition to previous records from Arizona and Mexico. CALIFORNIA: 21♂, BIG PINE, INYO COUNTY, June 8, 1937. 1♂, ARVIN, June 9, 1936 (R. M. and G. E. Bohart). 12♂, 3♀, BIG PINE, June 8, 1937 (Michener, on *Thelypodium brachycarpum* and *Parosela polyadenia*). 11♂, 10♀, north end of OWENS LAKE, INYO COUNTY, June 2 and 4, 1937 (Michener, on *Trifolium*). 11♂, 19♀, LONE PINE, INYO COUNTY,

May 2 and 31, 1937 (E. C. Van Dyke). NEVADA: 1 ♀, INDIAN SPRINGS, CLARK COUNTY, May 26, 1940 (Reeves, Cazier & Ting). NEW MEXICO: 1 ♂, ALBUQUERQUE, August, 1894 (Snow).

MEGACHILE (XEROMEGACHILE) SUBNIGRA var. ANGELICA Mitchell

It now seems probable that *M. blaisdelli* Mitchell is the female of *angelica*, and that this species represents a color variant of *M. subnigra* Cresson rather than a distinct species. The male (*angelica*) differs from *subnigra* chiefly in the pale pubescence of the legs and the presence of white apical fasciae on the abdomen. In *subnigra* the fasciae are lacking and the legs are black pubescent. Likewise the female (*blaisdelli*) is conspicuously white fasciate, while the female of *subnigra* is not, and no other constant differences have been found.

Megachile (*Xeromegachile*) *inyoensis* Mitchell, new species

In the key to females of *Xeromegachile* (Trans. Am. Ent. Soc. LXII, 1936, p. 326) this specimen runs to *M. hilata* or *redlandica*, but differs from both in the puncturation of the clypeus and in the lack of dark pubescence on the disc of the second abdominal tergum.

Female. Size: Length, 10.5 mm.; breadth of abdomen, 4 mm.; anterior wing, 7.5 mm.

Structure: Length and breadth of face subequal; eyes subparallel; clypeal margin straight; mandible 4-dentate; second joint of flagellum subequal to pedicel, the first joint longer; lateral ocelli very slightly nearer edge of vertex than to eyes; margin of vertex incurved; cheeks below broader than eyes, narrowed above; mid and hind metatarsi distinctly shorter and narrower than their tibiae; apical margins of segments 2-5 of abdomen distinctly though not deeply depressed; sixth tergum straight, with very short erect hairs visible in profile.

Puncturation: Minute and crowded at sides of clypeus and face, more distinct and relatively coarse in center of clypeus, the intervening spaces between punctures dull; fine and indistinct on the shining cheeks; deeper and more distinct, but fine and close on vertex medially, slightly more coarse and sparse laterally; fine and close on pleura above and on mesonotum and scutellum laterally, becoming more coarse and sparse medially and on pleura below; minute, dense and obscure on abdomen basally, becoming more distinct and sparse, but still very fine to fifth tergum, very fine and close on sixth tergum.

Color: Black; wings subhyaline; tegulae, wing nervures, flagella beneath, and spurs dark ferruginous to piceous.

Pubescence: Entirely white on face, cheeks, pleura, propodeum, legs and first two segments of abdomen, the under surfaces of the tarsi ferruginous; white around periphery of mesonotum, but with evident dark pubescence in center of disc and probably on scutellum (which is denuded); vertex with intermixed long pale hairs and shorter black ones; short and black on discs of third to fifth abdominal terga, the sixth with very short erect dark hairs and some very obscure whitish pile; segments 1-5 with entire white apical fasciae; scopa entirely pale yellowish, a few dark hairs on sixth sternum apically.

Holotype, female, No. 5232, Calif. Acad. Sci., Ent. PANAMINT MOUNTAINS, INYO COUNTY, CALIFORNIA, May 29, 1937 (E. C. Van Dyke) at Wild Rose C.C.C. Camp.

MEGACHILE (PSEUDOCENTRON) MORIO Smith

This is probably a melanistic form of *M. pruina* Smith. The variety *negropinguis* Mitchell seems to be intermediate in its color characters between *morio* and typical *pruina*.

MEGACHILE (SAYAPIS) INIMICA Cresson

The following notes on the habits of *inimica* as observed at San Antonio, Texas, were received from Mr. H. B. Parks: "This bee was not seen during the last part of June, all of July and until late August, when a few females were captured, while working valley sage (*Salvia ballolaeflora* Benth.) and four males on *Vitex negundo incisa*. These were the only males seen. In September the females were common, collecting both pollen and nectar from *Laciniaria punctata* Kuntze. All through October and up to this date, November 6, the females have worked *Ximenesia encelioides* Cav. abundantly for pollen and nectar. The females made their nests in 'worm holes' in mesquite trees or mesquite fence posts. The holes are lined with circles cut from the leaves of *Monisia pallida* Planch."

MEGACHILE (CHELOSTOMOIDES) FELIPIANA Mitchell

The type and only specimen of this species to be recorded previously was collected in San Diego County, California. The following record, therefore, is of the second specimen to be found.

1 ♀, SANTA RITA MOUNTAINS, ARIZONA, May 9, 1937 (W. Benedict).

A SYNOPSIS OF THE GENUS MICRALICTOIDES (Hymenoptera, Apoidea)

BY G. E. BOHART

Ensign, U. S. Navy

Genus MICRALICTOIDES (Timberlake)

Micralictoides Timberlake, 1939, Ann. Ent. Soc. Amer. 32:397 (as subgenus).

Size small (from 4 to 5 mm.); punctures of head and mesonotum broad and shallow as in beaten copper; legs black with testaceous markings or abdomen reddish and legs all black; body without metallic reflections; maxillary palpus nearly or quite as long as antennal flagellum of female; tibial spurs translucent pale testaceous with far separated, needle-like teeth, sometimes present on both margins; mesepisternal fossa extending anteriorly and posteriorly as a distinct groove from mesepisternal suture to posterior margin of mesepisternum; "enclosure" of propodeum with weak, irregular ridges disappearing toward posterior crest which presents a broadly rounded, obtuse profile; males without modified legs or antennal hairs; visible abdominal sternites of male simple, resembling those of female; seventh sternite of male with apical lobes slender, depressed, each with terminal incurved or hooked appendage; eighth sternite of male with a single median, articulating lobe and a simple, slender, apical lobe not over one-third the total sternite length; male genital capsule with stipites each bearing a simple, slender, apical lobe and with a common dilated basal portion larger than the cardo; sagittae small and scarcely arched basally above surface of stipites.

Genotype: *Halictoides altadenae* Michener.

Micralictoides is apparently the simplest in structure of the bees allied to *Dufourea* and so may be considered the most primitive. Among the species of *Dufourea*, *Micralictoides* resembles most the small "*Chloralictus*-like" group found in western United States and especially the latter's most primitive representatives, *leachi* Timberlake and *viridis* Timberlake. This would indicate for the group as a whole a New World origin centered in California with *Micralictoides* representing most nearly the ancestral type and with the Old World receiving an early migration through Siberia from forms like *leachi* and arriving in Europe as the "typical" *Dufourea* represented by the genotype, *minuta* Lepeletier.

KEY TO THE KNOWN SPECIES OF MICRALICTOIDES

1. Abdomen largely red.....*ruficaudus*
- Abdomen black.....2
2. Clypeus of female strap-like, at least three times as broad as long between anterior tubercles; male with antennal flagellar segments (except apical one) broader than long and with partially greyish facial hair.....*altadenae*
- Clypeus of female longer in proportion to width; male with most antennal segments as long as or longer than broad and with white facial hair.....*mojavensis*

TABLE I. COMPARATIVE MEASUREMENTS OF SPECIES OF MICRALICTOIDES

Species and Sex	Body* Length	Anterior* wing Length	Face length ant. view**	Face width ant. view**	Smallest distance between eyes**	Median Clypeal Length**
<i>ruficaudus</i> 5 males	4.1	2.5	43.2	50	33.2	21.5
<i>ruficaudus</i> 5 females	4.8	3.05	45.8	51.8	34.1	26.2
<i>altadenae</i> 3 males	4.5	3.05	44.3	54.2	34.8	18.3
<i>altadenae</i> 3 females	5	3.2	45	58.5	38	18
<i>mojavensis</i> 5 males	4.2	2.8	45.2	48.2	30.2	20.8
<i>mojavensis</i> 5 females	4.7	3.1	47	54.7	35.1	23

Micralictoides mojavensis Bohart, new species

(Pl. I, fig. 1, 3, 5)

Male: Black; apical two-thirds of mandibles reddish brown; antennae brownish black; abdominal venter and sixth and seventh tergites dark testaceous; first and second tarsal segments, bases and apices of tibiae and apices of femora pale testaceous; tibial spurs nearly white. *Head*: Clypeus less than twice as broad as long, sparsely punctate apically; frons and vertex coarsely, closely punctate, the punctures much less than one puncture width apart; lower half of face sparsely covered with decumbent white hair; apical five flagellar segments as long as or longer than broad. *Thorax*: Mesonotal punctures averaging about one puncture width apart; dorsum sparsely covered with erect white pubescence often longer than a flagellar segment; metathoracic leg with first tarsal segment slightly less than 4 times as long as broad; spurs of middle and posterior tibiae with teeth on both margins; "enclosure" of propodeum with irregular ridges rather strong almost to posterior margin. *Abdomen*: First three segments nearly glabrous medially and with small but distinct, apparently non-setigerous punctures, mostly many puncture widths apart; sides of first three segments and sides and dorsum of remaining segments sparsely covered with white pubescence.

Female: Color as in male except for flagellum which is yellow-

ish brown apically, tarsi which are dark testaceous to dark brown and abdominal venter which is nearly black; tibial spurs toothed on one margin only, pubescence around pygidium testaceous.

Holotype, male, MOJAVE, CALIFORNIA, April 11, 1938, on *Malacothrix* (G. E. Bohart). Allotype, GAVILON, LOS ANGELES COUNTY, CALIFORNIA, April 30, 1940, on *Gilia multicaulis* (P. H. Timberlake). Paratypes: 4 males, 10 females, GAVILON, CALIFORNIA, April 10, 17, 18, 30, 1940, on *Gilia multicaulis*, *Platystemum californicus*, *Salvia columbariae*, *Baeria gracilis* (P. H. Timberlake); 1 female, MOJAVE DESERT south of AVAUNTER MOUNTAINS, CALIFORNIA, April 30, 1927, on *Malacothrix californicus* (P. H. Timberlake).

The longer clypeus of the female, shorter tarsi, longer antennae, and peculiar seventh abdominal sternite of the male separate this from the other black species, *altadenae* Michener. The color of the tarsi and abdominal venter varies from pale testaceous to dark brown. The punctures of some specimens are more than one puncture's width apart on head and mesonotum. One female specimen from Mint Canyon, California, which may be a different species, has entirely setigerous abdominal punctures like *altadenae*.

MICRALICTOIDES RUFICAUDUS (Michener)

(Pl. I, fig. 4, 6)

Halictoides ruficaudus Michener, 1937, Ann. Mag. Nat. Hist., 19(10):397.

Black with dark brownish black appendages, first three and anterior half of fourth abdominal segments red. *Head*: Clypeus distinctly convex apically, less than twice as wide as long between anterior tubercles; lower half of face sparsely covered with decumbent white pubescence; punctures of frons coarse, dense, much less than one puncture width apart; antennal flagellar segments of male, except the apical one, broader than long. *Thorax*: Mesonotal punctures, except posteriorly on mesonotum, as coarse as those on head; dorsum covered sparsely with very short, erect white pubescence; legs entirely black to brownish black; metathoracic leg of male with first tarsal segment four times as long as broad; "enclosure" of propodeum with ridges irregular and not clearly distinct from one another. *Abdomen*: First three tergites nearly glabrous medially, with distinct, apparently non-setigerous punctures averaging a little more than one puncture width apart; pubescence of fifth and sixth tergites of female dark grey to black medially; impunctate posterior borders of first three tergites approximately unicolorous with the punctate portions.

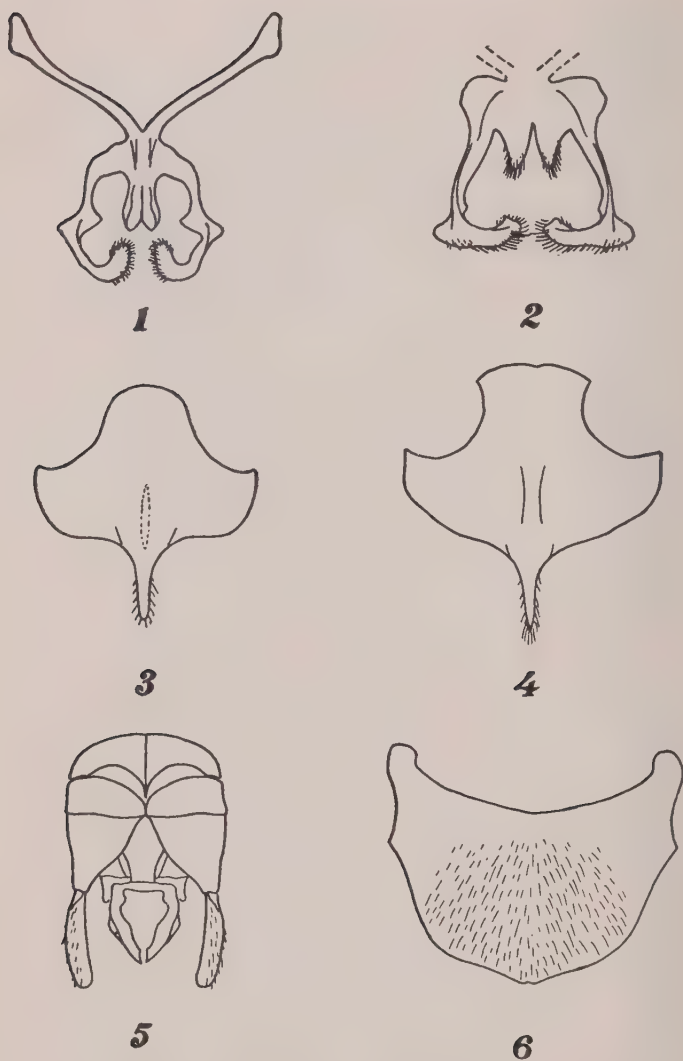


Fig. 1, *mojavensis*, male seventh abdominal sternite; fig. 2, *altadena*, male seventh abdominal sternite; fig. 3, *mojavensis*, male eighth abdominal sternite; fig. 4, *ruficaudus*, male eighth abdominal sternite; fig. 5, *mojavensis*, male genitalia in dorsal view; fig. 6, *ruficaudus*, male sixth abdominal sternite.

Records: Type series (C. D. Michener) ALTADENA, LOS ANGELES COUNTY, CALIFORNIA, from *Eschscholtzia californica*; 1 female, SAUGUS, LOS ANGELES COUNTY, CALIFORNIA, April 15, 1939, from *Cryptantha* (R. M. Bohart); 12 females, 5 males, RIVERSIDE, RIVERSIDE COUNTY, CALIFORNIA, April 15, 1938, from *Eschscholtzia californica* (P. H. Timberlake); 1 female, PLACERVILLE, PLACER COUNTY, CALIFORNIA, April 6, 1939, from *Nemophila menziesii* (G. E. Bohart); 1 female, MUIR WOODS, MARIN COUNTY, CALIFORNIA, May 4, 1913 (E. C. Van Dyke).

This species is easily distinguished by its red abdomen and wholly dark colored legs. There is some variation in the extent of red, in some specimens the fourth segment being wholly black and the second and third with dark lateral areas.

MICRALICTOIDES ALTADENAE (Michener)

(Pl. I, fig. 2)

Halictoides altadenae Michener, 1937, Ann. Mag. Nat. Hist., 19(10):395.

Black; antennal flagellum of female, mandibles, venter of abdomen and tegulae brown; basitarsi, bases of other tarsal segments and femoro-tibial joint areas brownish testaceous. *Head*: Clypeus of females strap-like, usually as broad as long between anterior tubercles, truncate along anterior margin; male with lower half of face covered with nearly erect greyish hairs about as long as the clypeus and with antennal segments two to ten broader than long. *Thorax*: Mesonotal punctures moderately close, averaging slightly less than one puncture width apart; some mesonotal pubescence longer than an antennal segment; males with first posterior tarsal segment over five times and second segment twice as long as broad; "enclosure" of propodeum finely, irregularly carinate, the carinae continuing but weakening toward posterior margin. *Abdomen*: Punctures of tergum numerous, tiny, setigerous, uniform in number except on impunctate testaceous hind borders of segments; female with abundant, fine, short pubescence medially on first three tergites and longer testaceous pubescence medially on fifth and sixth tergites.

Records: Type series (C. D. Michener) EAGLE ROCK, LOS ANGELES COUNTY, CALIFORNIA, May 9, 1936, from *Eriophyllum confertiflorum*; 1 male, ALISO CANYON, LOS ANGELES COUNTY, CALIFORNIA, May 3, 1934 (C. D. Michener).

The very short clypeus, slender male tarsi, greyish pubescence, and setigerous abdominal punctures of this species are characteristic. The seventh abdominal sternite of the male shows differences from *mojavensis* as illustrated. Markings of the legs vary from light to dark testaceous.

HEBRUS CURTIS ANTEDATES NAEOGEUS LAPORTE

(Hemiptera, Hebridae)

BY H. M. HARRIS

Iowa State College, Ames

There has been some question as to the priority of the generic names, *Hebrus* Curtis and *Naeogeus* Laporte, also as to their synonymy and the name to be applied to the family. Kirkaldy (Entomologist, 1900, p. 241), assuming that Laporte's work antedated that of Curtis cited *Hebrus* in synonymy and on the basis of the oldest included genus proposed for the group the family name *Naeogidae*. That the haplotype of *Naeogeus* (*erythrocephalus* Laporte) was congeneric with the haplotype of *Hebrus* (*pusillus* Fallen) had already been suggested by Spinola (Essai Hemip., p. 223, 1840) and Fieber (Europ. Hemip., p. 104, 1860). Horvath, however, was inclined to doubt that *Hebrus pusillus* Fallen and *Naeogeus erythrocephalus* were congeneric and based the family name more logically on its type genus—the type genus having been established by Fieber's use of *Hebroidea** in 1851. Now, if *erythrocephalus* and *pusillus* are congeneric, as modern hemipterists are agreed (actually most workers consider *erythrocephalus* Laporte as only a variety of the older *pusillus* Fallen), and if Laporte's paper antedates Curtis's as all recent bibliographies indicate, then the genus name *Naeogeus* will have to hold and the family name will be *Naeogidae*.

However, abundant evidence has been presented (China, Ann. Mag. Nat. Hist., (9) 19:114, 1927) to show that the paper by John Curtis, entitled "Characters of some undescribed Genera and Species indicated in the Guide to an Arrangement of British Insects," in which the genus *Hebrus* was established, was in print prior to January 10, 1833.

It now seems equally evident that Laporte's *Essai*, in which *Naeogeus* is established, did not appear in 1832 as is cited by most present-day hemipterists, but instead actually was not in print in its entirety until after April, 1833 (see Harris, *The date of publication of Laporte's Essai*, to follow in the next issue.) By reason of this, *Hebrus* Curtis, 1833, takes precedence over *Naeogeus* Laporte, 1833, and the name of the family of this group of bugs will be *Hebridae*.

* Horvath failed to indicate the use of *Hebridae* by Amyot and Serville in 1843.

TWO NEW CENTIPEDS FROM THE CHILIBRILLO CAVES,
PANAMA

BY RALPH V. CHAMBERLIN

University of Utah, Salt Lake City

The present article contains descriptions of two new centipeds, one in the family Scutigerae, the other in the Otostigmidae. The types of these species were collected in the Chilibrillo Caves, near Buenos Aires, Panama, by Mr. Kenneth W. Cooper through whose courtesy I have had the privilege of studying them. The types are in the author's collection at the University of Utah.

Pselliodes harveyi Chamberlin, new species

Having the general markings and appearance of *P. nigrovittata* (Meinert), the type locality for which is also Panama. It differs, however, clearly in the details of coloration. The median yellow stripe with lateral borders lighter yellow or almost white; a band on side of stoma but not extending in front of saddle distinctly orange in color; no black spot on saddle. A light sub-marginal yellow stripe on each side of this band interrupted near middle and not extending over caudal portion of plate.

Femora with dark annuli widely interrupted above and only the distal one complete below; the succeeding article dark at ends and with two broad complete dark annuli. Tibiae dark except for a narrow yellow annulus at end of about first third and one at distal end. Tarsi dark with light annuli except distal portion which is entirely yellow. First flagellum of antenna composed of about 57, mostly rather long, articles; the second flagellum of about 325 articles. First tarsal division of fourth legs composed of 12 articles, the second of 35 or 36. First division of tarsus of eighth legs composed of 8 articles, the second of 35.

Claws of gonopods of female more than twice the length of the consolidated base; claw angled on mesal side near middle, the angle bearing 4 or 5 stout spiniform setae. Tergite of genital segment strongly narrowed caudad and narrowly rounded at caudal end; subdensely setose above.

Length, about 20 mm.

Locality. Panama: Buenos Aires, Chilibrillo Cave A, on walls of main chamber. One female taken January 15, 1941, by K. W. Cooper. This species is dedicated to Professor E. Newton Harvey of Princeton University.

This is a much smaller and more graceful species than *P. cavicola* (Chamberlin), the type of which was taken in Guacharo Cave on Trinidad Island.

Otostigmus cooperi Chamberlin, new species

In the preserved holotype the dorsum is olive green with sides and legs a lighter green. The smaller paratype is described by Mr. Cooper as having been in life, "a superbly rich metallic purple with orange-red legs." As preserved it still retains a purple tinge but the legs are green as in the larger specimen.

Head appearing smooth and shining, under the lens showing shallow, scattered punctate antennae consisting of 17 articles of which the first two have the basal fourth (or less of the third) glabrous and shining.

First two dorsal plates nearly smooth but plates from third onward densely finely granular or scabrous. In the middle and posterior region the plates present a distinctly elevated median longitudinal ridge with a pair of similar ridges each side of it, with the surface ectad of the ridges on each side strongly wrinkled. In the more anterior region the ridges are still distinctly but less strongly developed but are not evident on the first two plates. The plates of the posterior region have the lateral margins elevated and rounded, the limiting furrows not sharply impressed, the margins less distinctly set off in the middle region and more or less vague and irregular on the most anterior plates.

Anal scutum with caudal margin obtusely angular; dorsal surface with a wide median longitudinal furrow which is divided anteriorly by a median ridge; lateral margins sharply elevated. Ventral plates without paired sulci; at middle of plate with a pair of shallow depressions. Last ventral plate narrowed caudad, the caudal margin weakly incurved; a median longitudinal furrow. Pseudopleurae rounded behind, entirely without processes or spines.

Tarsi of first three pairs of legs with two spines, those of fourth to twentieth with spine single. Femora of anal legs in female smooth, entirely lacking in spines.

Length of holotype, 95 mm.

Locality. Panama: In Chilibrillo Cave A at Buenos Aires. Two specimens taken January 18, 1941, on walls of main chamber. Reported by Mr. Kenneth W. Cooper as feeding on a "huge *Blaberus* nymph." Differs from *O. scabricaudus* (H. and S.) in the conspicuous dorsal ridges, larger size, green instead of yellow legs, etc. It is named for the collector.

NOTES AND DESCRIPTIONS OF SOME NORTH AMERICAN
PARASITIC BEES

(Hymenoptera, Nomadidae)

BY E. GORTON LINSLEY

University of California, Berkeley

The following descriptions are offered in advance of more comprehensive studies in order that the names may be available for the use of other workers who have requested them.

NEOPASITES Ashmead

Linsley and Michener¹, in their discussion of the misidentified genotype of *Neopasites*, did not sufficiently emphasize the fact that evidence of the misidentification is clearly given in the original description. Ashmead² states in his generic diagnosis that the "front wings have two complete submarginal cells, the first being longer" and that "the first recurrent nervure joins the first submarginal cell." Obviously, he was not describing *Phileremus fulviventris* Cresson, which he designated as his genotype, since in that species the two submarginal cells are about equal in length and the first recurrent nervure joins the second submarginal cell. On the other hand, the statements agree well with the group of species congeneric with *Neopasites camia* Ckll., the species upon which he actually based his generic description. These wing venational differences are not only of generic but possibly even of tribal value.

Trichopasites Linsley, new subgenus

Body form robust; integument coarsely punctate; pubescence squamiform; eyes densely clothed with fine, short, erect pubescence; ocelli small, anterior and lateral ocelli separated by at least three times their diameters; supra-antennal area polished, impunctate; sides of face at clypeal margin without a broad tooth.

Type: *Neopasites (Trichopasites) insoletus* Linsley.

This subgenus may be recognized at once by the small, widely separated ocelli and smooth supra-antennal area. The pilose eyes are found elsewhere only in *Odontopasites*.

¹ Linsley, E. G. and C. D. Michener, 1939, Trans. Amer. Ent. Soc., 65:277.

² Ashmead, Wm., 1898, Psyche, 8:284.

Neopasites (Trichopasites) insoletus Linsley, new species

Female: color piceus, abdomen, red; pubescence white, scale-like, forming patches on head, thorax, and abdominal tergites. *Head* with a conspicuous white patch at base of antennae, extending laterally nearly to the eyes and partially encircling the antennal insertions; occiput with an indistinct patch behind the eyes; antennae with first segment of flagellum subequal in length to the two following together; vertex coarsely, subcontiguously punctured; pubescence of eyes brownish; sides of face and clypeus coarsely, subcontiguously punctured, sparsely clothed with a few short, suberect, pale hairs; labrum carinate, coarsely punctate; mandibles reddish, base piceous. Thorax coarsely, closely punctate; mesoscutum with a thin patch of white pubescence along anterior half of median line and similar patches on each side, one just anterior to, the other to one side of, the tegulae; mesoscutellum with a subtriangular white pubescent patch on apical margin extending forward on median line for about one-third its length, lateral margin irregularly lined with white pubescence; vertical face of mesepisterna irregularly margined with white pubescence; mesosternum a little more shining and more irregularly, less closely punctured than mesoscutum; propodeum coarsely punctured, triangular area glabrous, finely punctured and tessellate. *Wings* pale brownish, first submarginal cell about twice as long as second, receiving first recurrent nervure just before apex (nearly interstitial with first transverse cubitus), second submarginal cell receiving its recurrent nervure at apical one-third. *Legs* clothed with short, suberect, pale hairs, with a few irregular patches of white hairs on posterior faces of femora and tibiae. *Abdomen* opaque, closely and rather coarsely punctured, indistinctly clothed with fine, pale hairs; first tergite with a white patch on each side of middle of basal margin and a pair of smaller patches at lateral apical margins, tergites two to four with an oval or subtriangular white spot on each side of middle at base and a similar patch on each side at lateral apical margin, these latter becoming smaller on successive segments, that of the fourth tergite only feebly indicated; fifth tergite with coarse longer golden hairs on each side of middle at base, apex densely fringed with fine, pale, erect hairs, sternites two and four with a narrow apical band of denser white pubescence, fifth sternite a little more densely pubescent than the preceding, apex slightly emarginate. Length, 5.5 mm.

Holotype, female, No. 5290, Calif. Acad. Sci., Ent., from TEX CANYON, CHIRACAHUA MOUNTAINS, ARIZONA, alt. 5000-6000 feet, September 16, 1927, J. A. Kusche, collector.

Odontopasites Linsley, new subgenus

Body form robust; integument coarsely punctate; pubescence squamiform; eyes densely clothed with fine, short, erect pubescence; ocelli large, anterior and lateral ocelli separated by less

than twice their diameters; supra-antennal area closely, coarsely punctate; sides of face at clypeal margin with a broad tooth.

Type: *Neopasites (Odontopasites) arizonicus* Linsley.

Distinguished from *Trichopasites* by the larger ocelli, shorter pubescence of the eyes, punctate supra-antennal area, and dentate sides of the face.

Neopasites (Odontopasites) arizonicus Linsley, new species

Female: color black, antennae, legs, and tegulae piceous or reddish, abdomen red; pubescence white, scale-like, forming patches on head, thorax, and abdominal tergites. *Head* with a dense patch of white pubescence about bases of antennae; vertex coarsely, subcontiguously punctured; labrum reddish, carinate for more than two-thirds its length; under side of head on each side of gular groove very closely punctate, punctures all less than one puncture width apart; mandibles pale reddish, base piceous. *Thorax* coarsely, closely punctate; pronotal tubercles densely clothed with white pubescence; mesoscutum with a small patch of white pubescence on median line at anterior margin, another beside tegulae, and a transverse line along apical margin at middle; mesoscutellum and metanotum with a dense white patch at each side; mesepisterna with a broken band of white pubescence along anterior, dorsal, and ventral margins of vertical face. *Wings* pale brownish; first submarginal cell much longer than second, receiving first recurrent nervure just before apex, second submarginal cell receiving its recurrent nervure at apical one-third. *Legs* clothed with short, suberect, pale hairs, with a few irregular patches of white hairs on posterior faces of femora and tibiae. *Abdomen* opaque, moderately coarsely, closely punctate; first tergite with a white patch on each side of middle at base and a small lateral white patch on apical margin; tergites two to four with a transverse band of white on each side of middle at base and a small apical patch at sides; sternites thinly pubescent, the pubescence a little denser along basal margins. Length, 6-7 mm.

Male: White pubescence denser; abdomen with white pubescent patches on tergites one to five; pygidial plate about one and one-half times as long as broad, apex broadly rounded. Length, 5-7 mm.

Holotype, female, No. 5290. Calif. Acad. Sci., Ent. and allo-type, male, and two female paratypes from YUMA, ARIZONA, May 6, 1939. R. M. Bohart, collector. Additional paratypes are as follows: a male and female, TUCSON, ARIZONA, August 2, 1909, A. K. Fisher, one male, HEREFORD, COCHISE COUNTY, ARIZONA, W. M. Mann (in collection of the Academy of Natural Sciences, Philadelphia) and three males from SAN PEDRO, 18 miles south of LA PAZ. LOWER CALIFORNIA, October 7, 1941, E. S. Ross and G. E. Bohart.

GNATHOPASITES Linsley and Michener

The discovery of several additional species of *Gnathopasites* has revealed the necessity for recognizing two subgeneric groups differing primarily in the form and structure of the maxillary palpi and venation of the wings.

Micropasites Linsley, new subgenus

Body small, form robust; integument finely punctate; mandibles with an inner tooth near apex; maxillary palpi short, composed of one or two free segments. Anterior wings with two submarginal cells, the second submarginal cell as long as first.

Type: *Neopasites cressoni* Crawford.

In *Gnathopasites*, s. str., the maxillary palpi are elongate and composed of four free segments and the second submarginal cell is a little shorter than the first. The species of the typical subgenus are also larger in size.

TOWNSENDIELLA Crawford

Three subgenera are now recognizable in this genus.

Xeropasites Linsley, new subgenus

Head with lateral ocelli separated by less than ocell-ocular distance; antennae with flagellum distinctly thickened beyond middle; maxillary palpi less than half as long as antennal flagellum, composed of four segments subequal in length but becoming successively slightly shorter toward apex, basal segment inserted on a tubercle; labial palpi with first segment about twice as long as second, third and fourth segments short, subequal in length, together about two-thirds as long as second segment. Wings moderately elongate, anterior pair about one and one-half times as long as thorax along mid-dorsal line; marginal cell moderately elongate, about as long as distance from its apex to tip of wing; first submarginal cell nearly twice as long as second; first recurrent vein received by second submarginal cell.

Type: *Townsendiella* (*Xeropasites*) *rufiventris* Linsley

This subgenus differs from typical *Townsendiella* in the shorter maxillary palpi which are only four-segmented, the thickened flagellum, the shorter wings and elongate first submarginal cell.

Townsendiella (*Xeropasites*) *rufiventris* Linsley, new species

Female: Color black or dark piceous, abdomen red, tegulae, legs and mouth-parts wholly or partially reddish; pubescence short, scale-like, white and yellowish brown. Head finely, closely punctate; pubescence of upper frons and vertex yellowish brown, dense

but not entirely obscuring surface, that of lower face denser, white, obscuring surface; inner ocular margins straight; antennae dark brownish; clypeus dark, anterior margin reddish, surface finely, closely punctate, pubescent; mandibles pale reddish, darker at apex. *Thorax* piceous; pronotum and tubercles densely clothed with yellowish brown hairs except a pair of white lines, frequently obliterated, on each side of middle and a narrow white marginal band; tegulae reddish; mesoscutellum, except disk, and metanotum densely white pubescent; mesoscutum and mesepisterna densely clothed with unbroken white pubescence which obscures the surface. *Wings* moderately narrow, anterior pair about two and one-fourth times as long as apical width; membrane slightly dusky, veins and stigma brown; marginal cell a little more than twice as long as greatest width; ratio of length of first submarginal cell to second, measured along posterior margin, 2:1. *Legs* reddish or piceous; posterior face of femora and outer face of tibiae densely clothed with white pubescence. *Abdomen* red; tergites finely, closely punctate, with a narrow band of dense white pubescence along apical margin and a patch of white pubescence at sides, sternites frequently brownish, more or less wholly white pubescent.

Male: Generally similar to female, legs and abdominal sternites frequently darker.

Holotype, female, allotype, male, and two paratypes from PALM SPRINGS, RIVERSIDE COUNTY, CALIFORNIA, March 26, 1932, collected by P. H. Timberlake. Types in the collection of P. H. Timberlake, Citrus Experiment Station, Riverside, California.

Eremopasites Linsley, new subgenus

Head with lateral ocelli separated by less than ocell-ocular distance; antennae with flagellum more or less uniform in diameter; maxillary palpi composed of six segments of unequal length, first segment shortest, second segment longest, more than twice as long as first, third and fourth segments subequal in length, each a little longer than first, about half as long as second segment, fifth segment just perceptibly longer than fourth, a little shorter than sixth which is two-thirds as long as second; labial palpi with first segment longest, second segment about two-thirds as long as first, third and fourth segments subequal in length, together nearly two-thirds as long as second segment. *Wings* short, anterior pair less than one and one-half times as long as thorax along mid-dorsal line; marginal cell short, much shorter than distance from its apex to tip of wing; first submarginal cell nearly twice as long as second; first recurrent vein received by first submarginal cell, rarely interstitial with first transverse cubitus.

Type: *Townsendiella californica* Michener.

Eremopasites differs from *Townsendiella*, s. str., in the short wings with the marginal cell barely more than half as long as

the distance from its apex to the tip of the wing, the first submarginal cell nearly twice as long as the second and usually receiving the first recurrent nervure near its apex. In addition, the proportions of the segments of the maxillary palpi are quite different. From *Xeropasites*, it may be separated by the six-segmented maxillary palpi, slender flagellum, shorter wings, etc.

THE TAXONOMIC STATUS OF *CICINDELA FORMOSA* SUBSPECIES *GIBSONI* W. J. BROWN

(Coleoptera, Cicindelidae)

BY RICHARD C. DAHL

Alameda, California

Since the description of *Cicindela formosa* subspecies *gibsoni* by W. J. Brown¹, there has been some argument as to its validity as a subspecies. The few facts presented herewith should help to clarify this difficulty.

It is first necessary to know that *Cicindela formosa* Say is considered a valid species, and that *C. f. generosa* Dejean and *C. f. manitoba* Leng are good subspecies. The latter two are geographical subspecies, since *generosa* can be connected by a continuous series of intermediates with typical *formosa* and *manitoba* is connected from its occurrence in the north, by a continuous series of intermediates, south to Kansas and Colorado, where typical specimens of *formosa* are found.

Gibsoni can be connected by a series of intermediates with *manitoba*. However, in this case both forms can be collected at the same locality. This is similar to the case of *latesignata* Lec., with a narrowed pattern and *obliviosa* Csy., with a uniformly widened pattern, both forms being collected from the same colony.

In the type series of *manitoba* the elytral pattern varies in width by degrees, and in one specimen the markings are widened so as to be almost identical to the drawing made by W. J. Brown. In the collection of the California Academy of Sciences, there is one specimen with the elytral markings wider than in typical *manitoba* and closely approaching *gibsoni*.

Hence the conclusion that *gibsoni* is the extreme form in uniformly widened elytral markings of *manitoba*, both of which occur regularly together. Under the circumstances, subspecific status seems unjustified.

¹ Brown, W. J. Some new and poorly known species of Coleoptera. Can. Ent. 72:182-187, 1940.

A NEW CTENOPHTHALMUS FROM FORMOSA
(Siphonaptera)

BY RUTH DOWELL SVIHLA

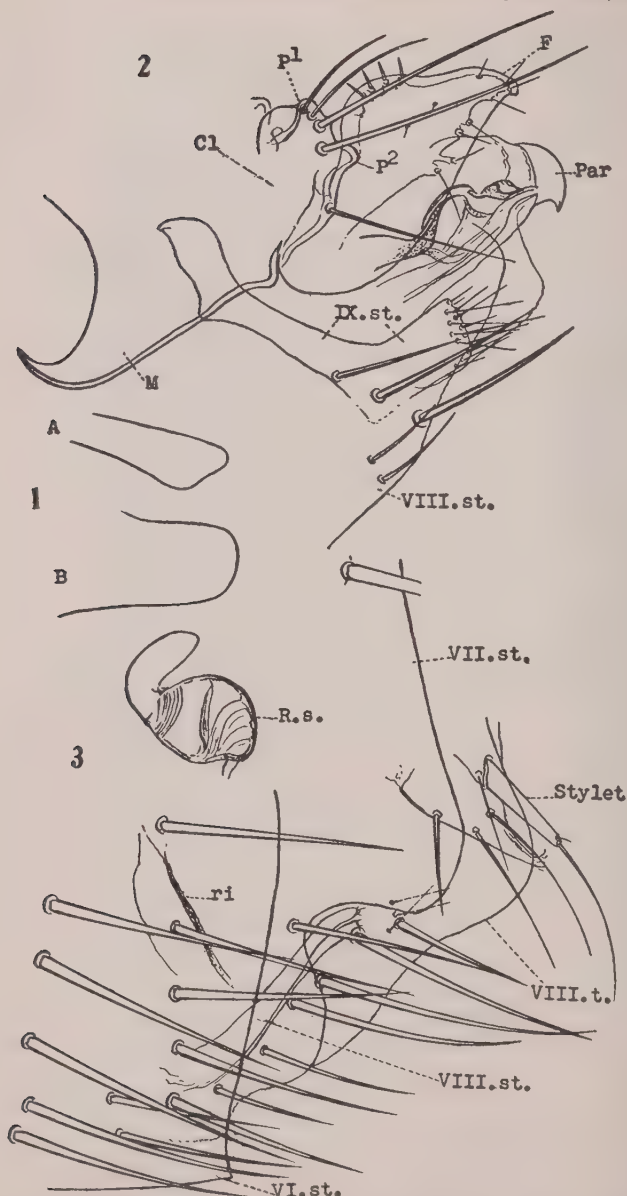
University of Washington, Seattle

To the best of our knowledge, this is the first species of *Ctenophtalmus* to be described from Formosa (Taiwan). It was collected from *Eothenomys melanogaster* (a microtine) at Arisan, Formosa, November 12, 1936, by Ruth and Arthur Svihla. The two nearest allied species are from China, *Ctenophtalmus yunnanus* Jordan 1932 (Novitates Zoologicae, XXXVIII, p. 287, no. 11, text-fig. 46) from Yunnan, only the male known; and *Ctenophtalmus dinormus* Jordan 1932 (Novitates Zoologicae, XXXVIII, p. 288, no. 12, text-fig. 47) from Szechuan, only the female known.

Ctenophtalmus formosanus Svihla, new species

Male: Genal process (above genal comb of 3 spines) as narrow as upper spine (fig. 1, A); obliquely flattened at distal end. Proboscis not quite reaching apex of forecoxa; with a curved bristle at apex. Pronotal comb of 18 spines, the small ventral ones inclusive. Epimeron of metathorax with 5 bristles (2, 3). Bristles in row before long ones on posterior terga of abdomen reduced to 1 or 2 each side. Abdominal sterna III to VII without bristles in front of row of long ones. Stigma of segment VIII of the Y-type; no bristles above it. Segment IV of hind tarsus barely one-half longer than broad. Fourth apical bristle of clasper (Cl. fig. 2) slightly more ventral than in *yunnanus*. Ventral arm of IX st. much shorter, broader and truncate. Digitiform sclerite F broader at apex. Paramere of phallosome (Par, fig. 2) with ventral apical hook, which is not present in *yunnanus*.

Female: Genal process (fig. 1, B) twice as broad as that of male and rounded distally. Upper and median lobes of VII st. (fig. 3) much broader than in *dinormus*. Sclerotization along apical margin of VII st. absent; the curved ridge of *dinormus* represented by a longer straight ridge (ri, fig. 3). Spermatheca (R.s., fig. 3) broader, but this is probably due to its body bearing a vertical fold in the middle which means that the spermatheca is artificially shortened and incidentally broadened; apex of its tail almost pointed, rounded in *dinormus*. VIII st. very narrow. Each tergite bearing two rows of bristles as follows: I, 3 and 5; II, 4 and 5; III and IV, 4 and 6; V and VI, 3 and 6; VII, 4 and 4; sternite II, none; III, 2 and 5; IV, 1 and 6; V, 1, 5 and 1; VI, 3 and 5.



Ctenophthalmus formosanus Svihla, n. sp. Fig. 1, genal process, A, male; B, female. Fig. 2, male genital segments. Fig. 3, female genital segments.

Mid-tarsal segments: ♂ 73, 65.7, 43.8, 29.2, 80.3 μ ; ♀ 87.6, 73, 51.1, 36.5, 73 μ .

Hind-tarsal segments: ♂ 219, 146, 80.3, 31.1, 87.6 μ ; ♀ 226.3, 160.6, 87.6, 51.1, 102.2 μ .

Length, ♂, 2 mm.; ♀, 2 mm.

Hind femur: ♂ 0.30 mm.; ♀ 0.36 mm.

FORMOSA (TAIWAN), ARISAN, Nov. 12, 1936, on *Eothenomys melanogaster*, 2 ♂♂, 1 ♀. No. 123.; type ♂ and paratype ♀ in author's collection, paratype ♂ in British Museum. I am very much indebted to Dr. Karl Jordan, F. R. S., for advice and help.

A NEW SPECIES OF DORYCEPHALUS

(Homoptera, Cicadellidae)

BY R. H. BEAMER*

University of Kansas, Lawrence

Dorycephalus sinuatus Beamer, new species

Resembling *D. platyrhynchus* Osb. but smaller with margins of head sinuate in female and dorsal surface of vertex of male covered with fine longitudinal ridges parallel to margins. Length of male 7.5 mm., female 13 mm.

Vertex of female almost three times as long as width between eyes; male one-third longer than width between eyes. Margins of vertex slightly sinuately converging to two-thirds as wide on outer half as through eyes. Disc of vertex highly arched two-thirds its length with median carina entire length in female; male with median carina much higher throughout, and general arching much less. Elytra of male rounded at apex, covering abdomen; those of female rather pointed, exposing pygofer and two abdominal segments.

Color of female stramineous; of male smoky brown.

Genitalia: Last ventral segment of female slightly longer than preceding segment; posterior margin slightly excavated to a rather broad median lobe. Male valve barely visible, broadly rounded, plates broader than valve at base, abruptly narrowed on basal half to long slender points; pygofer twice as long as plates.

Holotype male, allotype female, and one pair of paratypes, OAK CREEK CANYON, ARIZONA, July 9, 1941, R. H. Beamer. One male paratype, same data, E. L. Todd.

* Contribution from the Department of Entomology, University of Kansas.

COLLECTING WILD BEES IN THE YOSEMITE

BY T. D. A. COCKERELL

Boulder, Colorado

When our kind friend, Mr. Guy Haselton, the well-known photographer of Hollywood, offered to take us to the Yosemite, my wife and I were, of course, delighted to go with him, never having visited this famous valley. We were there from May 5 to 11, 1941, probably the best time of year to enjoy the extraordinary beauty of the place, which I will not pretend to describe. I will only refer to the great abundance of the western dogwood, its great white flowers conspicuous everywhere. This plant was named *Cornus nuttalli* by Audubon, who figured it with the band-tailed pigeon in his famous work on American birds. The bees recorded were taken on the floor of the valley (alt. approx. 4000 ft.), except a few from the Myers Ranch, 11 miles away, at a considerably higher altitude. I could not have prepared this report without the aid of Mr. P. H. Timberlake and access to the collection at the University of California Citrus Experiment Station at Riverside. Timberlake critically examined the specimens and gave me his determinations, which are certainly the most reliable to be had at the present time. Even in the case of species which I myself described, it frequently happens that I have not looked at them for a long time, perhaps a quarter of a century; and in addition, they now have to be differentiated from numerous related species, more recently made known.

My list of captures represents, of course, but a fragment of the actual bee fauna, but it is interesting as an introduction to the subject. Mr. Darwin Tiemann, of the Yosemite Museum, has been collecting bees, and has obtained many species (especially of *Osmia*) which I did not find. I make no further reference to these now, as I presume a list of his captures will eventually be published.

Where no locality is given, the floor of the valley, not far from Yosemite Lodge, is to be understood.

ANNOTATED LIST OF SPECIES

Hylaeus verticalis Cresson. One male at Myers Ranch, visiting *Ranunculus californicus* Benthams, May 9.

Sphecodes sp. Male. Same as presumed new species found at Riverside.

Sphecodes sp. Females of two different species, believed to be

new. Timberlake has a long series of apparently new *Sphcodes*, which he will publish as circumstances may permit.

Halictus aspilurus Cockerell. Three females at flowers of *Nemophila exilis* Eastwood.

Halictus mellipes Crawford. At *Cryptantha flaccida* (Douglas), female (W. P. Ckll.), and at *Ribes*.

Halictus (Seladonia) tripartitus Cockerell. At *Nemophila exilis*, three females. This is the *H. catalinensis* Ckll., as generally understood in California, but we follow Miss Sandhouse in considering this and *H. meliloti* Ckll., as forms of *H. tripartitus*. It may be possible to define two or three subspecies, on careful study of a sufficient amount of material.

Halictus n. sp. Timberlake MS. A species related to *H. bardus* Cresson, taken by Timberlake on San Jacinto Mtn. He also has one from the Yosemite, collected by D. W. Clancey. I took one female at flowers of *Ribes*.

Agapostemon californicus vandykei (Cockerell). Three females at *Nemophila maculata* Benthams. This beautiful insect, with brassy tints on the abdomen, is apparently to be separated as a race of the common green species of California.

*Andrena** sp. Male at *Salix*. Allied to *A. placida* and *A. medionitens*. Timberlake says that *A. medionitens* Ckll. occurs in this region in June.

Andrena sp. One at *Salix* (W. P. Ckll.). This is apparently identical with one from *Ribes*, which was seen by Viereck and labeled by him "near *excellens*."

Andrena albihirta (Ashmead). Two females at *Salix*, differing by the darker venation. A male from *Salix* should be this, but does not quite agree.

Andrena auricoma Smith. Not quite typical. At *Salix*, *Oenothera*, *Montia perfoliata* and *Cryptantha flaccida*.

Andrena nigrocaerulea Cockerell. One female at *Nemophila exilis*. Compared with the type it seems to be the same species, but there is some difference in the process of the labrum. A female from *Oenothera* has a more shining clypeus (approaching herein *A. epileuca* (Ckll.) but dullish abdomen.

Andrena monogonoparia Viereck, n. subsp. Timberlake MS. One female at *Arctostaphylos patula* at Meyers Ranch. Timberlake got it in the San Bernardino and San Jacinto Mtns.

* The genus *Andrena* is represented in California by very many species, a large proportion of them still undescribed.

Andrena n. sp. Timberlake MS. Five females at *Ribes*. Timberlake also collected it at *Ribes*.

Panurginus sp. Two females at *Nemophila exilis*. Probably *P. atriceps* Cresson, but the male is needed.

Nomada erythraea Dalla Torre. At *Arctostaphylos patula* Greene.

Nomada sp. Female at *Arctostaphylos patula*. It runs in my key (Proc. Acad. Nat. Sci. Phila., 1903, p. 559) to California species to *N. tintinnabulum* Ckll., but it is 8 mm. long, and differs in many respects. It is probably new, and it is not in the collection at Riverside.

Chelostomopsis rubifloris (Cockerell). A common species; twelve females and fifteen males were taken. It visits *Cryptantha flaccida*

Bombomelecta pacifica Cresson. One at Myers Ranch, May 9 (W. P. Ckll.).

Osmia lignaria Say. Very many nesting in the ground along a path. Females at *Cercis* and *Nemophila exilis*; males at apple, *Ribes* and *Nemophila exilis*. This species was originally described as nesting in wood, as the name implies. The ground nesting habit is surprising, and raises again the question as to the possible distinctness of the western *O. propinqua* Cresson.

Osmia faceta Cresson. One male at *Nemophila exilis*. Tiemann gave me one he collected on *Azalea*.

Osmia densa pogonigera (Cockerell). At *Salix* (W. P. Ckll.), and at Myers Ranch at *Arctostaphylos patula*. We also took nine males which are presumed to belong here, at *Nemophila maculata* and *N. exilis*, at *Salix*, and one taken by Tiemann on *Azalea*.

Osmia coloradensis Cresson. One male at *Nemophila maculata*, May 11.

Osmia californica Cresson. Five males, at *Ribes*, *Arctostaphylos patula*, and *Nemophila*. This is *O. nassa* Ckll., which according to Miss Sandhouse is the true *O. californica*, that species having been misunderstood.

Osmia atrocyanea Cockerell. Male on yellow violet, and two at Myers Ranch, on *Arctostaphylos patula*.

Osmia kincaidii Cockerell. At *Nemophila exilis* (W. P. Ckll.) and at *Cryptantha flaccida*.

Osmia pusilla Cresson. One at *Nemophila exilis* (W. P. Ckll.).

Osmia cyanella Cockerell. One, May 10.

Osmia wheeleri Cockerell. At *Cercis* and *Nemophila exilis*. There has been much confusion as to the identity of *O. brevis* Cresson, and it may be that the species here recorded is the true *O. brevis*.

Ceratina acantha submaritima (Cockerell). Both sexes. It was found on *Cryptantha flaccida*, *Nemophila maculata*, *N. exilis* and *Oenothera*.

Ceratina nanula rigdenae Michener. One male at *Nemophila maculata*, May 11.

Ceratina punctigena Cockerell (or possibly *C. subpunctigena* Michener). One male at *Oenothera*, May 10 (W. P. Ckll.).

Xylocopa orpifex Smith. One male at *Nemophila patula* (W. P. Ckll.).

Psithyrus crawfordi Franklin. One, May 10.

Bombus vosnesenskii Radoszkowski. May 11. A variety with the light hair on head and thorax very pale.

A NEW SPECIES OF TIPHIA FROM CALIFORNIA (Hymenoptera, Tiphidae)

BY KARL V. KROMBEIN

*Bureau of Entomology and Plant Quarantine
United States Department of Agriculture*

The following description of a new species of *Tiphia* is offered at this time so that a name will be available for some observations on the biology by Dr. E. G. Linsley and Dr. C. D. Michener. Dr. Linsley has been kind enough to permit the writer to place the type series in the collection of the United States National Museum except for a pair of paratypes which are to be deposited in the collection of the California Academy of Sciences.

Tiphia shastensis Krombein, new species

Female. 14.5 mm. long. Black; mandible in the middle castaneous; flagellum beneath and apex of pygidium ferruginous. Body inconspicuously clothed with grayish, suberect pilosity which is longer, more conspicuous, and tending toward yellowish at the apices and sides of the abdominal segments; hind tibial calcaria black; some of the tarsal spines fulvous. Wings brownish, somewhat infumated; stigma and basal veins dark brown, the apical veins lighter.

Head shining, moderately closely and coarsely punctured; mandible not denticulate along the superior or inferior margin; clypeus on basal half with several rows of subcontiguous punctures, apical half impunctate, apical margin broadly rounded;

vertex much less closely punctured than the front; areas immediately in front of the fore ocellus and laterad of the hind ocelli deeply impressed so the fore ocellus faces forward and the hind ocelli more laterad than is normal for the genus; postocellar distance three-fifths the ocellocular distance; a slight groove runs from between the antennal insertions about one-third the distance to the fore ocellus; post-mandibular triangle glossy with a very delicate shagreening and several minute punctures.

Dorsal surface of pronotum shining, anterior transverse carina lacking, posterior third impunctate, anterior two-thirds moderately closely punctate, minute, interspersed punctures lacking; lateral surface of pronotum subopaque with delicate oblique rugulae on upper half and oblique carinae on lower half, median oblique groove lacking; propleuron subopaque, moderately closely punctate with a few scattered, interspersed, minute punctures; scutum shining, with a median patch of dense minute punctures and a few scattered larger ones on the adjacent areas; tegula glabrous, about as broad as long, with a groove along the outer and posterior margins; scutellum shining, with a few large punctures which are concentrated on the lateral and posterior margins of the disk; postscutellum shining, with a few scattered large punctures; mesopleural disk shining, with scattered large punctures and a few interspersed minute ones, posteriorly with numerous minute punctures; propodeum dull above, enclosure subrectangular, slightly over twice as long as wide, the base a bit wider than the apex, and with a distinct median ridge, area adjacent to enclosure moderately shagreened and with numerous minute punctures; posterior surface of propodeum shagreened and dull, set off from the dorsal and lateral surfaces by strong ridges and with a few irregular carinae at the upper angles and along the sides; lateral surface of propodeum shining on the upper half, with 18 to 20 strong oblique ridges, the lower half with numerous oblique rugulae and a few scattered minute punctures; sensorium of hind tibia shallow, broad and pyriform in outline; hind basitarsus with a longitudinal groove; forewing with basal angulation of radial vein about one-third the distance from stigma to first complete transverse cubital vein.

First tergite of abdomen with anterior declivous portion covered with minute punctures and a few interspersed larger ones, base of posterior horizontal portion without a transverse carina, the horizontal portion posteriorly with a shallow transverse groove bearing two to three rows of subcontiguous punctures, the apex of the first tergite not strangulate; second tergite shining, with scattered fine punctures dorsally and several rows of subcontiguous punctures just before apex; third to fifth tergites subopaque from delicate shagreening, each more closely punctured than the second on the disk and with a denser concentration of subcontiguous punctures near the apex; pygidium on basal portion coarsely and closely punctate with a small impunctate area at apex medianly, the

apical portion moderately shagreened without punctures or rugulae, the apical margin unusually broadly rounded, subtruncate; first sternite dull, closely and minutely punctured, median length of the disk about two-thirds the width at apex; second sternite shining, with scattered punctures; third to sixth sternites subopaque from fine shagreening, finely and more closely punctate than the second.

Male. Differing from female as follows: 9.0 mm. long. Mandible, flagellum and apex of pygidium black.

Clypeus rather closely punctate on basal half, median production impunctate, about one-fourth as wide as basal width of clypeus, apical margin of the production with a broad obtusely angulate emargination; front subcontiguously punctured, with a slight median carina extending from between the antennal insertions halfway toward fore ocellus; areas anterior to and laterad of ocelli impunctate, the ocellar triangle punctured; postocellar distance about two-thirds the ocellular distance; vertex and temples with numerous minute punctures and a few interspersed larger ones; postmandibular triangle impunctate; fourth to thirteenth antennal segments each with a longitudinal carina on outer surface.

Anterior two-thirds of dorsal surface of pronotum closely punctate; propleuron with numerous minute punctures and a few interspersed larger ones; scutum and disk of scutellum with scattered punctures about equal in size to those on pronotum; postscutellum with a median longitudinal groove; mesopleural disk posteriorly with the minute punctures more numerous though not so closely placed; propodeal enclosure two-thirds as wide at apex as at base, area adjacent to enclosure with a few large punctures near enclosure and a few irregular carinae at antero-lateral corners; lateral surface of propodeum shining on upper and posterior portions with 10 to 12 oblique rugae, remainder of surface subopaque with numerous oblique rugulae; sensorium of hind tibia much narrower; forewing with second complete transverse cubital vein curved outwardly, the apex of the second submarginal cell extending slightly farther distad than apex of marginal cell.

Abdominal segments 3 to 7 subopaque owing to delicate shagreening; anterior declivous portion of first tergite closely punctate; third to sixth tergites more closely punctured than second on the disk; seventh tergite subopaque, finely and subcontiguously punctured, with a median longitudinal impunctate line; anterior portion of disk of first sternite with a few subcontiguous large punctures, posteriorly with scattered minute punctures, the median length of disk about three-fourths the apical width; second sternite about as sparsely punctate as the corresponding tergite; third to fifth sternites each without lateral teeth or ridges; third to sixth sternites minutely punctured, the punctures more concentrated toward the apices; seventh sternite rather closely punctured on basal two-thirds, the apical third and a median longitudinal ridge on apical two-thirds impunctate.

Type ♀ OLD STATION, SHASTA COUNTY, CALIFORNIA; May 29, 1941 (E. G. Linsley) [U. S. National Museum, Type No. 55680]. Allotype ♂ taken in attempted copulation with and mounted on same pin as type [U. S. N. M.]. Paratypes 3♀, 1♂ topotypical and taken on same date as type (C. D. Michener) [2♀ in U. S. N. M.; 1♀, 1♂ in Calif. Acad. Sci.].

The female paratypes vary from 14-15 mm. in length and the male paratype is 9.5 mm. long.

Tiphia shastensis appears to be most closely related to *T. rugulosa* Malloch and *T. odontogaster* Viereck. The following triplet gives in some detail the structural characters separating the three species.

Basal angulation of radial vein of forewing about one-third the distance from stigma to first complete transverse cubital nervure; wings brownish, somewhat infumated; third to fifth tergites in female and third to sixth in male more finely and closely punctate than in *rugulosa* and *odontogaster*, the interspaces subopaque from fine shagreening. *Female*: Apex of pygidium very broadly rounded, the apical margin subtruncate; sensorium of hind tibia broad, shallow and pyriform in outline; length 14-15 mm. *Male*: Fifth sternite without lateral tooth or ridge; dorsal surface of propodeum adjacent to enclosure punctate and dull.....*shastensis* Krombein, n. sp.

Basal angulation of radial vein of forewing about one-third the distance from stigma to first complete transverse cubital vein; wings hyaline with a slight brownish cast in female, clear hyaline in male; third to fifth tergites in female and third to sixth in male more coarsely but less closely punctate than in *shastensis*, the interspaces glossy. *Female*: Apex of pygidium more narrowly rounded, the apical margin not subtruncate; sensorium of hind tibia narrower than in *shastensis* but broader than in *rugulosa* and deeper than in either species; length 9-10 mm. *Male*: Fifth sternite (occasionally third and fourth also) with lateral tooth or ridge; dorsal surface of propodeum adjacent to enclosure rugulose and shining.....*odontogaster* Viereck

Basal angulation of radial vein of forewing one-fifth to one-sixth the distance from stigma to first complete transverse cubital nervure; wings hyaline with a slight brownish cast; third to fifth tergites in female and third to sixth in male more coarsely but less closely punctate than in *shastensis*, the interspaces glossy. *Female*: Apex of pygidium more narrowly rounded, the apical margin not subtruncate; sensorium of hind tibia narrower than in *shastensis* but about as shallow; length 8-9.5 mm. *Male*: Fifth sternite without lateral tooth or ridge; dorsal surface of propodeum adjacent to enclosure shining and more closely rugulose than in *odontogaster*.....*rugulosa* Malloch

The male of *shastensis* actually keys out at *occidentata* Malloch in Malloch's key (Bull. Illinois Nat. Hist. Survey, XIII, p. 5, 1918) but the latter species is immediately separated by the shape of the first tergite, which is strangulate apically and nodose when viewed laterally. In my opinion *occidentata* belongs to an entirely different species group than do the three species discussed above because of the differently shaped first tergite.

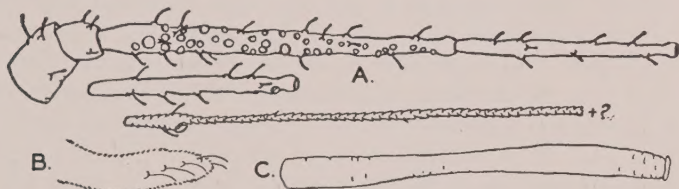
AMPHOROPHORA OSBORNI¹

(Homoptera, Aphididae)

BY GEORGE F. KNOWLTON

Utah Agricultural Experiment Station, Logan

The following description deals with an apparently undescribed aphid, collected in Utah on a black currant bush heavily infested by *Amphorophora ribiella* (Davis), a species which it somewhat resembles.



Amphorophora osborni Knowlton, n. sp. A, antenna; B, lateral view of cauda; C, cornicle, of apterous vivipara.

Amphorophora osborni Knowlton, new species²

Apterous vivipara: Color green; body 2.1 mm. long; antennae 2.41 mm., pale except distal ends of III, IV, V, and all of VI which are blackish; antennal III, 0.75 to 0.8 long with 36 to 37 sensoria; IV, 0.448, without sensoria; V, 0.496; VI, 0.128 + 0.86 (+? ends broken off); rostrum reaching hind coxae; rostral IV + V slenderly obtuse, 0.16 mm.; hind tibiae 1.46; hind tarsi 0.13; cornicles pale, 0.87 long, slightly swollen on distal half; cauda pale, 0.34 mm. long, with 3 or 4 hairs on each side of distal one-half.

Collected upon foliage of *Ribes longiflorum*, at Cedar City, Utah, June 15, 1935, by G. F. Knowlton. Type in the collection of the writer.

Amphorophora osborni has more sensoria on antennal III, and its cornicles are longer than those of *A. ribiella* (Davis), *A. nabali* (Oest.) and *A. pergandei* Mason.

¹ Contribution from the Department of Entomology, Utah Agricultural Experiment Station, Logan.

² Named in honor of my former professor, Dr. Herbert Osborn.

THE AMERICAN COMMISSION ON SCIENTIFIC NOMENCLATURE IN ENTOMOLOGY

The disturbed condition of the world during the last few years has interfered with the activities of the International Commission on Zoological Nomenclature and there is no prospect that this Commission will again function successfully for several years to come. Entomologists in the United States have felt that this situation should not be allowed entirely to stifle progress in the development of nomenclature and the clarification of nomenclatorial problems. At the meetings of the Entomological Society of America and the American Association of Economic Entomologists in San Francisco, in December, 1941, a plan was adopted which called for the establishment of an American Commission on Scientific Nomenclature in Entomology.

In accord with the terms of this plan, Mr. C. F. W. Muesebeck and Professor G. F. Ferris were appointed to organize the Commission. That organization has now been completed and the Commission is ready to function. It includes Prof. J. C. Bradley, of Cornell University; Mr. W. J. Brown and Mr. G. Stuart Walley, of the Division of Entomology of the Department of Agriculture of Canada; Prof. G. F. Ferris, of Stanford University; Prof. T. H. Hubbell, of the University of Florida; Prof. H. B. Hungerford, of the University of Kansas; Dr. E. G. Linsley, of the University of California at Berkeley; Prof. Clarence E. Mickel, of the University of Minnesota; Dr. C. F. W. Muesebeck and Dr. P. W. Oman, of the United States Bureau of Entomology and Plant Quarantine; Prof. A. G. Richards, Jr., of the University of Pennsylvania; Dr. Herbert H. Ross, of the State Natural History Survey of Illinois; Prof. C. W. Sabrosky, of the State Agricultural College of Michigan, and Dr. R. L. Usinger, of the University of California at Davis. Prof. G. F. Ferris has been elected as Chairman.

The Commission will receive, consider and advise upon such nomenclatorial problems as are presented to it. All acts of the Commission will be in harmony with the International Rules of Zoological Nomenclature, although recommendations for the clarification, extension and improvement of these rules may be made. The Commission will report to the two parent societies at their next annual meeting. Communications concerning matters within the province of the Commission may be addressed to any of its members.